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# TRANSACTIONS OF THE INDIANA HORTICULTURAL SOCIETY.

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# TRANSACTIONS

OF THE

# Indiana Horticultural Society

## FOR THE YEAR 1889,

BEING THE

Proceedings of the Twenty-Ninth Annual Session,

HELD AT

INDIANAPOLIS, DECEMBER 3, 4 AND 5,

ALSO THE

PROCEEDINGS OF THE SUMMER MEETING HELD AT MITCHELL, AND THE STATE FAIR MEETING, TOGETHER WITH REPORTS FROM LOCAL SOCIETIES, VICE-PRESIDENTS' REPORTS, PAPERS, RECOMMENDED FRUIT LIST BY COUNTIES, ETC.

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*By C. M. HOBBS, Secretary.*

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INDIANAPOLIS:
WM. B. BURFORD, CONTRACTOR FOR STATE PRINTING AND BINDING.
1890.

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# OFFICERS

OF THE

# INDIANA HORTICULTURAL SOCIETY

## FOR THE YEAR 1890.

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President—Jos. C. Ratliff, Richmond.
Vice President First District—Joseph A. Burton, Mitchell.
Vice President Second District—Dr. C. C. Cornett, Madison.
Vice President Third District—W. A. Workman, Greencastle.
Vice President Fourth District—Jesse C. Stevens, Centerville.
Vice President Fifth District—G. W. Grant, Pulaski.
Vice President Sixth District—I. D. G. Nelson, Ft. Wayne.
Secretary—C. M. Hobbs, Bridgeport.
Treasurer—Daniel Cox, Cartersburg.

EXECUTIVE COMMITTEE.

J. J. W. Billingsly, Indianapolis.
L. B. Custer, Logansport.
Professor J. Troop, Lafayette.

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# VICE PRESIDENTS

AND THE

## COUNTIES COMPOSING THEIR RESPECTIVE FRUIT DISTRICTS.

FIRST DISTRICT.—Joseph A. Burton, Vice President. Crawford, Daviess, Dubois, Gibson, Green, Knox, Lawrence, Martin, Orange, Perry, Pike, Posey, Spencer, Sullivan, Vanderburgh and Warrick.

SECOND DISTRICT.—Dr. C. C. Cornett, Vice President. Bartholomew, Brown, Clark, Dearborn, Decatur, Floyd, Franklin, Harrison, Jackson, Jefferson, Jennings, Ohio, Ripley, Scott, Switzerland and Washington.

THIRD DISTRICT.—W. A. Workman, Vice President. Boone, Clay, Clinton, Fountain, Hendricks, Monroe, Montgomery, Morgan, Owen, Parke, Putnam, Tippecanoe, Vermillion, Vigo and Warren.

FOURTH DISTRICT.—J. C. Stevens, Vice President. Blackford, Delaware, Fayette, Grant, Hancock, Hamilton, Henry, Howard, Jay, Johnson, Madison, Marion, Randolph, Rush, Shelby, Tipton, Union and Wayne.

FIFTH DISTRICT.—G. W. Grant, Vice President. Benton, Cass, Carroll, Fulton, Jasper, Laporte, Marshall, Newton, Porter, Pulaski, Starke, St. Joseph and White.

SIXTH DISTRICT.—I. D. G. Nelson, Vice President. Adams, Allen, Dekalb, Elkhart, Huntington, Kosciusko, Lagrange, Miami, Noble, Steuben, Wabash, Wells and Whitley.

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# CONSTITUTION

OF THE

# INDIANA HORTICULTURAL SOCIETY.

1. This Society shall be known as the "INDIANA HORTICULTURAL SOCIETY."

2. Its officers shall consist of a President, six Vice Presidents (who shall be elected one from each Fruit District, and by virtue of their election, members without fee for the time for which they are chosen), Secretary, Treasurer, and Executive Committee of three.

3. The President shall preside at and conduct all meetings of the Society, and in his absence the Vice Presidents, in their order, shall perform the same duties.

4. The Secretary shall record all the doings of the Society, collate and prepare all communications, etc., for the public press, and pay over all money received from members, or otherwise, to the Treasurer, on his receipt; shall receive and answer all communications addressed to the Society; establish and maintain correspondence with all local, county, district and State Horticultural Societies, and secure by exchange their transactions, as far as possible, to aid the President, as an executive officer, in the dispatch of business relating to the meetings of the Society; preparing and publishing circulars and notices of horticultural and similar meetings of general interest, and report to the annual meeting of the Society an abstract of the matter that has come into his possession, which, with its approval, shall become part of the transactions for the present year.

5. The Treasurer shall collect and hold all funds of the Society, and pay out the same only on the order of the Secretary, countersigned by the President.

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6. The officers shall be elected separately and annually, by a ballot vote, and hold their office until their successors are elected.

7. The object of the Society being to collect, condense and collate information relative to all varieties of fruits, and dispense the same among the people, every member, except the Vice Presidents, shall pay into the treasury one dollar a year for the purpose of publishing and other expenses: *Provided*, That members of local Horticultural societies may become members by paying into the treasury, through their respective local organizations, the sum of fifty cents each. Any person interested in horticulture may become a member by forwarding to the Treasurer or Secretary the fee of membership.

8. Every member shall be entitled to a copy of the transactions of the Society as often as the same shall be published.

9. The President, Secretary and Executive Committee may call a meeting of the Society at any time and place they may consider advisable, by a notice of thirty days in the public press.

10. It shall be the duty of each Vice President to make an annual report to the Society upon the fruit crop in his respective district, together with such recommendations and suggestions as may seem best for the interests and advancements of horticultural knowledge within said district, which shall be, by the Secretary, published in the transactions of the Society for the year in which such reports are made.

11. This Society shall hold its annual sessions on the first Tuesday in December in each year, and at such place as the Society shall designate at its previous meeting. It shall be the duty of the Executive Committee to procure rooms and make all necessary arrangements for the meetings of the Society, to make out a programme of business for each meeting, and attend to such other duties as the Society may from time to time direct.

12. The officers of this Society shall constitute a Board of Horticulture, five of whom shall constitute a quorum for the transaction of business, the officers of the Society to be officers of the board, said board to meet immediately on the adjournment of the Society and afterward on their own adjournment. It shall be the duty of the Board of Horticulture to collect horticultural information, and they shall be authorized to employ an agent or agents to visit different portions of our State or

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adjoining States to collect information of general interest, and shall be authorized to draw on the treasurer for money to pay the expenses of said agent or agents, when there is money in the treasury not otherwise needed, and said board shall make full and accurate reports of their proceedings, with all horticultural information collected, to the regular meeting of the Society.

13. By-laws and alterations in the constitution, for the purpose of governing further wants of the Society, may be enacted by a majority of the members present at any regular session.

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## MEMBERSHIP.

### HONORARY MEMBERS.

J. M. Smith.....Green Bay, Wis.
H. E. Van Deeman.....Washington, D. C.
T. J. Burrill.....Champaign, Ill.
N. Ohmer.....Dayton, Ohio.
I. D. G. Nelson.....Ft. Wayne, Ind.
R. T. Brown.....Indianapolis, Ind.
J. C. Teas.....Carthage, Mo.
*Z. S. Ragan.....Independence, Mo.
Dr. Allen Furnas.....El Modena, Cal.
Dr. A. F. White.....Santa Rosa, Cal.
F. I. Mann.....Gilman, Ill.

### LIFE MEMBERS.

E. Y. Teas.....Dunrieth.
Joseph C. Ratliff.....Richmond.
C. M. Hobbs.....Bridgeport.
Joe A. Burton.....Mitchell.
Andrew T. Skanklin.....Wild Cat.

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*Deceased.

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ANNUAL MEMBERS.

G. W. McIntosh.....Rego.
L. B. Custer.....Logansport.
R. M. Lockhart.....Waterloo.
J. W. Ragan.....Fillmore.
James Sanders.....Westfield.
Homer T. Frost.....Edinburg.
W. A. Workman.....Greencastle.
A. Glenn.....Columbus.
J. H. Parks.....Bourbon.
W. C. Bennett.....Scotland.
R. D. Henderson.....Pleasantville.
M. B. Sturgus.....St. Louis, Mo.
W. C. Reed.....Vincennes.
H. M. Simpson.....Vincennes.
John Fullhart.....Muncie.
Daniel W. Ronk.....New Ross.
Rev. F. R. Holland.....Hope.
Prof. J. Troop.....Lafayette.
H. L. Gaiser.....Seymour.
Dr. Chas. C. Cornett.....Madison.
W. H. Ragan.....Greencastle.
J. S. VanVleet.....Franklin.
John Bird.....Raysville.
T. S. Teas.....Spiceland.
M. Elliott.....Warsaw.
Eph Hodges.....Paragon.
Will E. Stacy.....Lyons.
W. H. Rice.....Bainbridge.
A. C. Hill.....Lizton.
O. C. Sterling.....Camden.

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## LOCAL SOCIETY MEMBERS.

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WAYNE COUNTY SOCIETY.

C. W. King.....Richmond.
Isham Sedgwick.....Richmond.
Geo. H. Lewis.....Chester.

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Jesse C. Stevens.....Centerville.
Daniel Bulla.....Richmond.
Jacob D. Hampton.....Chester.
Miss Mary Parry.....Richmond.
Walter S. Ratliff.....Richmond.

MARION COUNTY SOCIETY.

J. J. W. Billingsly.....Indianapolis.
E. A. Eikhoff.....Indianapolis.
Franklin Taylor.....Indianapolis.
J. G. Kingsbury.....Indianapolis.
Fielding Beeler.....Indianapolis.
Benjamin Tyner.....Indianapolis.
Jesse Wright.....Indianapolis.
E. S. Pope.....Indianapolis.
W. B. Flick.....Indianapolis.
Peter Rabb.....Indianapolis.
A. F. Denny.....Indianapolis.
T. C. Barnum.....Indianapolis.
J. H. Vajen.....Indianapolis.
C. A. Howland.....Howland.
E. J. Howland.....Howland.
J. J. Millhouse.....Valley Mills.
A. M. Patton.....Howland.
W. K. Ross.....Southport.
Sylvester Johnson.....Irvington.
J. C. Apple.....Oaklandon.
Nathan Harvey.....Bloomingdale.
William Mustard.....Broad Ripple.

MONROE COUNTY SOCIETY.

A. Ketchum.....Clear Creek.
I. Milt Rodgers.....Bloomington.
Benj. Dunn.....Bloomington.
Geo. P. Campbell.....Bloomington.
W. H. Neeld.....Bloomington.
Jos. S. Dinsmore.....Bloomington.
Wm. M. Bunger.....Bloomington.
Fred Fess.....Bloomington.

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HENDRICKS COUNTY SOCIETY.

James Little.....Cartersburg.
M. W. Frazier.....Danville.
B. H. Carter.....Clayton.
Wm. Leitzman.....Clayton.
Daniel Cox.....Cartersburg.

HANCOCK COUNTY SOCIETY.

J. K. Henby.....Greenfield.
W. B. Walker.....Greenfield.
L. Tyner.....Greenfield.
Marion Steele.....Greenfield.
J. F. Coffin.....Westland.

FLOYD COUNTY SOCIETY.

James P. Applegate.....New Albany.
Jonathan Beard.....New Albany.
Shelby Lidikay.....Edwardsville.
Matthias Schlgerter.....Edwardsville.
Martin V. Hanger.....Edwardsville.
L. Yenowine.....Edwardsville.

DELAWARE COUNTY SOCIETY.

Granville Cowing.....Muncie.

LAWRENCE COUNTY SOCIETY.

Dr. E. S. McIntire.....Mitchell.
E. W. Hainey.....Harrodsburg.
Morgan Keane.....Mitchell.
Wm. Turley.....River Vale.

GRANT COUNTY SOCIETY.

Snead Thomas.....Marion.

ORANGE COUNTY SOCIETY.

W. F. Sears.....Orleans.

RANDOLPH COUNTY SOCIETY.

D. E. Hoffman.....Winchester.

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# ANNUAL MEETING

HELD IN THE

# Agricultural and Horticultural Rooms

IN THE

## STATE HOUSE

## December 3d, 4th and 5th, 1889.

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TUESDAY, A. M.

On account of the removal of the President, Dr. Allen Furnas, to California, Vice President Jos. A. Burton, of Mitchell, took the chair and called the meeting to order at 10:30 A. M.

The Secretary submitted his annual report, as follows:

### THE SECRETARY'S FINANCIAL REPORT FOR 1889.

DISBURSEMENTS.

| | |
|---|---|
| Postage | $13 54 |
| Printing | 24 25 |
| Miscellaneous | 21 05 |
| Expressage | 7 20 |
| | $66 04 |
| Salary | 250 00 |
| Total | $316 04 |

RECEIPTS.

| | |
|---|---|
| Received on account of office expenses | $66 04 |
| Received on account of salary | 250 00 |
| Total | $316 04 |

WARRANTS DRAWN ON THE TREASURER.

| | | |
|---|---|---|
| No. 1. | Jan. 4 1889, J. W. Carter, short-hand reporting | $20 00 |
| No. 2. | May 24, 1889, S. Johnson on account of fruit exhibit | 13 45 |
| No. 3. | May 24, 1889, E. H. Robbins, reporting summer meeting | 15 00 |
| No. 4. | May 24, 1889, Wm. B. Burford, printing annual report | 105 90 |
| No. 5. | May 24, 1889, C. M. Hobbs, salary 1888 and part of 1889 | 300 00 |

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| | | |
|---|---|---|
| No. 6. | May 24, 1889, Daniel Cox, expenses as treasurer. . . . . | $5 00 |
| No. 7. | Aug. 13, 1889, J. Webster, expenses attending summer meeting | 8 70 |
| No. 8. | Aug. 13, 1889, Theo. F. Longenecker, expenses attending summer meeting. . . . . | 12 60 |
| No. 9. | Aug. 13, 1889, Allen Furnas, expenses as President 1888 and 1889 . . . . . | 20 00 |
| No. 10. | Aug. 13, 1889, C. M. Hobbs, part of salary . . . . . | 50 00 |
| No. 11. | Oct. 30, 1889, C. M. Hobbs, office expenses . . . . . | 66 04 |
| No. 12. | Oct. 30, 1889, C. M. Hobbs, remainder of salary. . . . . | 150 00 |
| | Total . . . . . | $766 69 |

C. M. HOBBS,
*Secretary.*

## REPORT OF TREASURER.

*To the Indiana Horticultural Society:*

RECEIPTS.

From Dec. 6, 1888, to Oct. 31, 1889—

| | |
|---|---|
| Cash on hand . . . . . | $12 50 |
| Received of State Auditor . . . . . | 1,400 00 |
| Membership fee . . . . . | 66 00 |
| Total . . . . . | $1,478 50 |

DISBURSEMENTS.

From Dec. 6, 1888, to Oct. 31, 1889—

| | |
|---|---|
| Paid on orders from Nos. 1 to 12. . . . . | 766 69 |
| Balance. . . . . | $711 81 |

DANIEL COX,
*Treasurer.*

Dr. Chas. C. Cornett, Jas. C. Ratliff and W. A. Workman, were appointed a committee to whom was referred the Secretary's and Treasurer's reports.

On motion, Prof. J. Troop, of Purdue University, was appointed as expert judge on fruit display.

*J. C. Ratliff.* There is considerable California fruit on our exhibition tables. We have with us at this time Prof. White, from that State; I would like that he be added to that committee as an act of courtesy. I therefore make a motion to that effect.

Carried.

Prof. White being formally introduced to the Society, said: "I am exceedingly hoarse, having taken cold recently, and can not talk as I would desire. But I want to suggest to you this,

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when you get into the discussion of the specialty of the vine, or of the fig, the nectarine or apricot, or some one of the great number of fruits we raise in abundance there, I will take part in the discussion. I might throw some light on the insect pest which we have there in abundance. We have been warring against them for twenty-five years, and we are beginning to see daylight ahead, and ere long we shall conquer all the insect pests. I wish to give you some facts, which may be of some benefit to you when you come to examine your fruit and trees. Our efforts have been attended with much success, and I am only sorry that Prof. Riley is not here to make remarks upon our success. I refer to the cottony bush scale bug. It is one of the most destructive pests we have. We think we have at last discovered a mode by which we can exterminate it from our orchards. Then we have the red scale, and have succeeded in destroying them. We have also the San Jose scale, and what you have here in your orchards. We have discovered a remedy for the woolly aphis, and with the same remedy we kill the San Jose scale. I would like to tell you something about these pests, because I do not want to make remarks to hear my voice, but to give you substantial information that will be of benefit to you. If you have such information as will be helpful to us I am sure we shall be glad to have you give it to us. Then we have the wine question, the insects and the diseases affecting the vine, and we have a variety of them. I can tell you something that would astonish you. I would like to talk with you when you are discussing the subject of wine or the vine. I do not want to be understood now as against the use of wine, or in any way sensitive to this question. But the great question on the Pacific coast is how to get rid of those pernicious insects and other diseases of the vine. There are some things shrouded in darkness in this matter, but we will be glad to help you all we can. We have many other interests that are gradually assuming importance in our country, inviting us to be up and doing. We are having interesting discussions, gathering facts in regard to mode of culture, diseases of fruits, and many things of a practical nature. Some ten years ago gentlemen would come to California from the Eastern States, remain five or six years and then return home; they would publish various and conflicting statements that would not be understood in this country. These gentlemen were not design-

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ing to injure California, but their statements were the result of ignorance. We have a great variety of climate, and many very desirable places to live, and some that are not so desirable. I would like to address you at any time the Society may see proper on this subject."

*J. C. Ratliff.* These remarks have been interesting to all of us no doubt. I am at this time reminded that we have another gentleman with us, Mr. Mann, a delegate from the Illinois Society who, no doubt, could interest us in a few remarks.

*F. I. Mann, Gilman, Ill.* I am not here to make a speech, but come merely as a delegate to the Indiana Horticultural Society. I do not know that I have anything of special importance to say. We feel, in Illinois, that we have many things yet to learn. We meet and discuss the various topics pertaining to horticulture; we have insects to contend with as well as California; but I want to say that we have the codling moth on the run as well as several other insects.

*Pres. J. A. Burton, Mitchell.* If Professor White can tell us what to do with the woolly aphis which works on the roots of trees, we will be under obligations to him. I have had some trouble in this way and would be well repaid for coming here if I could learn what to do for it. I have a small orchard, some over a thousand trees, and I notice that this pest has been working on the roots of some of them to their injury. I would like to have a remedy.

E. J. Howland, Mr. Carter and E. Albertson were appointed a committee on Final Resolutions.

On motion of W. A. Workman, the following were appointed a committee to devise a better method of arranging the fruit display at the State Fair: J. A. Burton, J. C. Ratliff, E. J. Howland, W. A. Workman and C. M. Hobbs.

Adjourned to 1:30 P. M.

### Afternoon Session.

1:30 O'CLOCK.

The Society convened at the appointed hour, with acting President Burton in the chair.

The President's annual address from President Dr. Allen Furnas, of El Modence, California, was read by Secretary Hobbs:

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EL MODENA, CAL., Nov. 25, 8189.

*Fellow Members of the Indiana Horticultural Society:*

At this remote distance from you, and having severed my citizenship from Indiana, it may appear impertinent that I should presume upon any official relations to your body, but I hope you will hear my last official message, which, I promise you, shall be very brief.

So far as I am able to judge, our society is enjoying as bright prospects for the future as ever it did, and I anticipate much good yet to be done by it. I believe Indiana is just beginning to learn how to go about her horticultural work. It will improve by past experience and prune off and shorten in, in some directions, and widen its labors in others. While the apple grower has had much to discourage him in the past, I have an abiding faith that varieties are already discovered, and that others, through your labors and investigations, will be discovered that will make apple growing in Indiana a reliable business. In this connection I want to call your attention to the increasing reputation and growing demand for the Grimes Golden Pippin. I have carefully watched this variety for over twenty years, and all this time its popularity has been on the increase, and now where it is best known it is most appreciated and called for. Other varieties are coming to the front while experience, sad experience, too, has taught us that some of the older varieties must be abandoned, at least so far as profit is concerned.

Much as has been said about pear blight, and much as I have lost by blight, yet what trees have borne have been more remunerative than the apple.

The plumn ever promised so well as now. It would seem that it is going to be a reliable crop, and most of this hope is inspired by the Chicasaw family.

Without enumerating all classes, I wish to say a word about small fruits. Indiana can, and should, grow as good and as large crops of strawberries as any State in the Union. But inside the State, as a whole, it is the worst market in the Union. By this remark I mean the fruit grower has the least control of the market. I would recommend a fruit growers' union, which shall labor to the end that steadier and better prices be obtained. I find where I am now, especially in the larger cities, that the markets are much more under the control of the producer than in the Eastern States. To bring about this desirable state of affairs, let more thorough organization be effected all over the State. I would like to hear of one or more horticultural societies in every county of the State.

Don't forget the florists; extend to them the right hand of fellowship. Recognizing the fact that Hoosiers understand their own business best, I forbear further suggestions. With best wishes for your success, I am, truly yours,

A. FURNAS.

The address was referred to the following committee for consideration: Dr. Charles C. Cornett, W. A. Workman and S. H. Frazier.

Professor J. Troop, Superintendent of the Experiment Stations, submitted the following report:

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## REPORTS FROM EXPERIMENT STATIONS.

BY PROF. J. TROOP, PURDUE UNIVERSITY, LAFAYETTE.

The following report comprises a brief account of the work done, horticulturally, during the past year at the Experiment Station, and also the substance of reports from the managers of the sub-stations:

But few additions have been made to the list of orchard fruits during the past year. Our object has been not to purchase any more trees, as the remaining space will all be needed for future planting as trees are sent in for trial. The list of small fruits has been somewhat extended by numerous new varieties which have been sent in for testing.

While the growth of all these plants has been good, the season as a whole has not been favorable for the production of fruit, owing to the heavy frosts of last May, which destroyed most of the young fruit. Apples, pears and cherries produced no fruit whatever; but very few plums; grapes were nearly all killed, as was the case with early strawberries. Raspberries and blackberries were a full crop.

Of orchard fruits we now have growing 90 varieties of apples, 25 varieties of pears, 30 varieties of cherries, 30 varieties of plums, two varieties of peaches, two varieties of apricots, three varieties of quinces. A portion of these have been growing for four years, and another year will doubtless begin to give some results.

In my report last year I stated that in my opinion the Robinson plum would do to recommend for general cultivation. This was based on the results of a single year's trial; but after another year's experience I am not so confident about it. It is a good bearer, but for canning purposes it falls far below our ideal of what a plum ought to be, it being very astringent. As far as its being curculio proof is concerned, I may say that our entire crop was destroyed this year. Marianna makes a beautiful, stocky tree, but unless it proves more prolific than it has done thus far it is not worth the room it occupies unless it be to bud with some other sorts.

Of small fruits we now have thirty varieties of grapes, five varieties of gooseberries, thirteen varieties of currants, fourteen varieties of blackberries, twenty-five varieties of raspberries, and ninety-seven varieties of strawberries.

The following is a list of those varieties that we consider of more or less value, depending somewhat on the soil and cultivation:

GRAPES.—Beauty, Brighton, Concord, Early Victor, Eaton, Elvira, Empire State, F. B. Hays, Improved Delaware, Jefferson, Jessica, Jewel, Martha Moore's Early, Mary's Favorite, Meyer, Nectar, Niagara, Poughkeepsie Red, Ulster, Vergennes, Wilder, Woodruff Red, Worden.

GOOSEBERRIES.—Early Orange, Downing, Houghton, Industry, Mountain.

CURRANTS.—Cherry, Crandall, Red Dutch, White Dutch, Fay, Lee's Prolific, Wilder.

BLACKBERRIES.—Ancient Briton, Erie, Lucretia, Minnewaski, Snyder, Taylor, Wallace.

RASPBERRIES.—Acme, Ada, Brandywine, Cuthbert, Hilborn, Hopkins, Nemeha, Rancocas, Reliance, Shaffer, Turner and Tyler.

STRAWBERRIES.—Belle of LaCrosse, Bickle, Bidwell, Black Defiance, Bombay, Bubach's No. 5, Bubach's No. 24, Bubach's No. 132, Captain Jack, Carmichael,

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Clara, Clingto, Cloud, Cohanzic, Cornelia, Cokell's Early, Cowing, Crawford, Crescent, Cumberland, Daisy, Daniel Boone, Downing, Dutter, Enhance, Eureka, Gandy, Gold, Green Prolific, Glendale, Gypsie, Haverland, Henderson, Indiana, Itasca, Jersey Queen, Jessie, Kentucky, Lady Rusk, Logan, Longfellow, Lower, Manchester, May King, Miami, Monmouth, Mrs. Cleveland, Neptune, Nobes, Ohio, Ohio Centennial, Park Beauty, Pearl, Photo, Pioneer, President Lincoln, Sharpless, Sucker State, Summit, Wabash, Warfield, Warren, Windsor Chief, Woodruff No. 1, Woodruff No. 2.

The following list has not come up to the standard, on our grounds, and therefore can not be recommended for general cultivation:

BLACKBERRIES.—Crystal White, Early Cluster, Early Harvest, Wilson, Jr.

RASPBERRIES.—Arnold's Hybrid, Crimson Beauty, Golden Queen, Hansell, Marlboro.

STRAWBERRIES.—Atlantic, Bancroft, Belle Bordelais, Bonanza, Burt (same as Captain Jack), Cinderalla, Connecticut Queen, Countess, Dewey, Early Canada, Emerald, Garretson, Great American, Jewell, Jumbo (same as Cumberland), Marvin, Old Iron Clad, Ontario (same as Sharpless), Parry, Pineapple (same as Bonanza), Prince of Berries, Royal Haulhois, Vineland, Wilson.

Following is a list of varieties most commonly grown in the localities where the sub-stations are located, as reported by managers. Those which appear first in the list have been reported from the greatest number of places:

APPLES.—Ben Davis, Wine Sap, Rome Beauty, Rambo, Smith's Cider, Maiden's Blush, Red Astrachan, Roman Stem, Baldwin, Northern Spy, Grimes' Golden, Vandivere, Rawles' Jennet, Yellow Belleflower, Early Harvest, St. Lawrence, Red June, Stark, R. I. Greening, Twenty Ounce, King, Autumn Strawberry, Black Sweet, Lawver, English Hagloe, Fall Wine, Willow Twig, White Pippin.

PEARS.—Bartlett, Flemish Beauty, Seckle, Duchess, Louise Bonne, Early Catherine, Kiefer, Mt. Vernon, Tyson, Hoenshenck, Sheldon.

PLUMS.—Wild Goose, Robinson, Lombard, Washington, Golden Beauty, Coe's Golden Drop, Miner, Jefferson, Green Gage, Prunus Simoni.

CHERRIES.—Early Richmond, Early May, Montmorency, Morrello, Dye House, Olivett.

GRAPES.—Concord, Worden, Niagara, Moore's Early, Ives, Hartford, Isabella, Duchess, Pocklington,.

CURRANTS.—Fay, Red Dutch, White Dutch, Wilder.

GOOSEBERRIES.—Downing, Mountain, Houghton, Smith.

BLACKBERRIES.—Snyder, Taylor, Kittatinny, Lawton, Ancient Britton, Wilson, Jr.

RASPBERRIES.—Gregg, Turner, Cuthbert, Soughegan, Mammoth Cluster, Tyler, Thwack, Marlboro, Miami, Shaffer, Ohio, Doolittle, Nemaha.

STRAWBERRIES.—Crescent, Cumberland, Haverland, Bubach, Warfield, Jessie, Gandy, Itasca, Manchester, Captain Jack, Sharpless, Green Prolific, Logan, Photo, Norman, Cloud, Monmouth, Jersey Queen, Downing.

## REPORTS FROM SUB-STATIONS.

These reports, though differing somewhat from the usual form, give some interesting information as to the varieties most extensively grown in each locality, as well as the comparative yield and prices of the different kinds of fruit for the past two years.

J. TROOP.



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L. B. Custer, Logansport, reports as follows:

The orchard trees have been mostly furnished by agents, and are composed of a great number of varieties. Fruits are not extensively grown for market. Usually there are enough apples grown to supply the home market and some to ship. As to berries, they are not grown very extensively. I suppose that fully three-fourths of the berries consumed here are brought from other points. As to varieties mostly grown they are:

APPLES.—Early Harvest, Red Astrachan, Red June, Maiden's Blush, Rambo, Baldwin, Ben Davis, Grime's Golden, Rawles' Jennet, Roman Stem, Rome Beauty, Smith's Cider, Northern Spy, Wine Sap, Willow Twig, Yellow Bellflower, Vandevere Pippin.

PEARS.—Bartlett, Flemish Beauty, Seckle.

CHERRIES.—Early Richmond.

GRAPES.—Concord, Clinton, Ives, Worden, Delaware.

BLACKBERRIES.—Snyder, Kittatinny.

RASPBERRIES.—Gregg, Mammoth, Cluster, Doolittle, Turner.

STRAWBERRIES.—Crescent, Captain Jack, Sharpeless, Green Prolific.

SUPPLEMENTARY REPORT FROM MR. CUSTER.

The Russian apple trees on my grounds are doing moderately well. Moregi proved too tender to continue its cultivation and was discarded.

The Bessemianka and Sapriganka pear trees continue very hardy and made a good growth this season.

PLUMS.—Robinson, De Soto, Golden Beauty and Prunus Simoni are growing rapidly. The three former fruited the past season. The Prunus Simoni are full of fruit buds for next year.

The curculio got their work in on the plums. The Robinson was full. The De Soto and Golden Beauty were full, but the fruit of the latter is not worthy of the name. I do not know of what use we have for them.

CHERRY.—The Brusseler Braun and George Glass each made a good growth. They seem to be very hardy, although one of the B. B. died at the end of the growing season, after making a fair growth.

The Ulster grape is a very slow grower; has not fruited.

Lucretia dewberry is a poor grower. It ripened a few berries of good size and excellent quality.

Gainor blackberry made a fair growth.

RASPBERRIES.—Golden Queen is a poor bearer; berries soft, of good quality.
Reliance, fair bearer.
Ohio, much like Doolittle.
Brandywine, tender, fair bearer.
Carman made a fair growth.

GOOSEBERRY.—Downing bore full; berries fine; no mildew.

CURRANTS.—White Dutch, fruit small; poor bearer.
Black Naples, poor quality.
Moore's Ruby and Lee's Prolific each made a good growth.

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STRAWBERRIES.—Jersey Queen, good grower; shy bearer; poor quality.
Atlantic, poor grower; shy bearer; poor quality.
Norman, poor grower.
Photo, moderate grower.
Logan, poor grower.
On account of late spring frost the three latter varieties did not bear.

J. Beard, New Albany, reports as follows:

Nearly everything at the Station here is doing well. The Russian apples have all made a fair growth.

Nos. 378 and 161 are very vigorous. No. 161 fruited this year; ripened the latter part of August. Fruit medium size, a little rounder than Maiden's Blush, resembling it very much in color. Quality fair.

PLUMS AND PEARS ALL DOING WELL.

Prunus Simoni moderately vigorous; growth erect; needs cutting back annually.

Weaver, moderately vigorous.

DeSoto, vigorous; bloomed but set no fruit.

Robinson, loaded down with fruit; badly affected by curculio; fruit rather bitter; inferior to Wild Goose.

Lombard, very vigorous.

Washington, a vigorous, upright grower.

The Satsuma sent me last spring made a remarkable growth. Some branches are four feet long. It is a beautiful tree. The bark is a reddish cast. The leaves resemble the peach. If it proves hardy here it will be a valuable acquisition to our list of plums

Burbank's made a fair growth.

Golden Beauty also made a very fair growth.

Bessimanka pear made a very fair growth this season.

Everything sent me has proven perfectly hardy so far.

APPLES.—Ben Davis is the apple grown here for market. It flourishes in most any kind of soil, and when properly cared for and the fertility of the soil kept up, it produces full crops nearly every year.

STRAWBERRIES.—Charles Downing is still at the head. It grows to perfection in this soil. Crescent Seedling does well. Cumberland is grown to some extent. It is a fine berry, but is a shy bearer. It is a good fertilizer for the Crescent. I fruited the Jessie this year. It did not come up to my expectation. It is almost identical with Sharpless. It is a shy bearer. However, I shall not condemn it yet, as one year is no test. Next year I will fruit the Gandy, Bubach, Warfield and Cloud.

RASPBERRIES.—Miami, Souhegan and Gregg are our most profitable blacks, and Cuthbert and Turner the best reds.

BLACKBERRIES.—Ancient Briton I consider the best and most profitable. It is perfectly hardy. Snyder and Taylor both do well here.

GRAPES.—I have fruited only a few of the new varieties. Moore's Early I consider the best early grape that I have tested. Worden is a fine grape, better than the Concord. Ripens about one week earlier than Concord. Clear of rot with me. Pocklington is the best white grape that I have tested. Bunch large and com-

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pact. These are the only varieties among the new ones that I have tested that I would recommend.

QUINCES.—The Orange is the best. The Champion I shall dig up; it has proven unprofitable to me Trees blight badly every year.

The soil here is a clay loam of fair fertility, with a red clay sub-soil.

## YIELD AS COMPARED WITH 1888.

Apples 50 per cent. greater. Price 25 per cent. better. 100,000 barrels shipped from New Albany this season.

Strawberries 25 per cent. greater. Price 30 per cent. better. 270,000 gallons shipped from New Albany.

Raspberries 20 per cent. greater. Prices 20 per cent. better. 180,000 gallons shipped from New Albany.

Blackberries not very extensively grown. Yield 40 per cent. better than in 1888. Price about the same. About 20,000 gallons shipped from New Albany.

Peaches 75 per cent. less. Prices 50 per cent. greater. About 8,000 bushels shipped away.

All the above kinds of fruits are grown principally for market. Other fruits are grown principally for home use.

From A. Glenn, Columbus:

The principal varieties grown here are Wine Sap, Ben Davis, Jennet, Rome Beauty, Stark, King, Black Sweet and Smith's Cider. Not much fruit grown here except for home use.

The yield of orchard fruits was below the average; that of small fruits, except strawberries and gooseberries, was good. Prices for all kinds were equal to or above those of 1888.

From Weir Bros, Laporte:

None of the fruits except berries are grown for market. Apples were only about a half a crop, while pears and cherries produced an average crop. No plums and peaches raised. Small fruits produced abundantly.

From A. L. Folger, Manilla, Rush County:

The apple crop was short, none to ship. A good supply of pears and cherries, enough for home demand and some shipped. But few quinces are raised. The plum crop was short this year, as was the currant and gooseberry crop. There was a good supply of berries, many bushels being shipped, but prices ranged a little lower than in 1888.

From Sylvester Johnson, Irvington:

Only strawberries and raspberries are grown for market, the balance for home use. The yield of all kinds was about equal to that of the previous year, while the prices ranged a little lower. The varieties mostly grown are as follows:

APPLES.—Rome Beauty, Rambo, Maiden Blush, Roman Stem, Vandevere, Wine Sap.

PEARS.—Bartlett, Seckel, L. Bon, E. Catharine, Kiefer, Duchess.

PLUMS.—Wild Goose, Robinson, Prun's Simoni, Miner.

PEACHES.—Not much grown.

CHERRIES.—Early Richmond, or Early May.

QUINCES.—Not much cultivated. Too tender.

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CURRANTS.—Red and White Dutch.

GOOSBERRIES.—Houghton, Smith and Mountain Seedling.

BLACKBERRIES.—Snyder and Taylor.

RASPBERRIES.—Gregg, Souhegan, Thwack, Marlboro.

STRAWBERRIES.—Crescent, Cumberland, Haverland, Itasca, Jessie, Manchester, Bubach No. 5.

From J. N. Latta, Haw Patch:

There is no commercial fruit grower within eight miles of me, and then only one and he a poor success. Fruit of all kinds is grown here by *all*.

Of apples, more kinds are grown than in any other place that I ever have seen, and almost every orchard has the Baldwin, Northern Spy, Red Astrachan, Rambo and Greening.

PEARS.—Bartlett and Flemish Beauty are to be found in almost all orchards, together with many I do not know.

PLUMS.—Wild Goose, and they were very fine last year.

Peaches rotted very badly, and can not be said to be a success.

CHERRIES.—Early Richmond is the universal favorite.

Quinces do not do very well, the Champion ripening this year for the first time.

The only currants bought are Fays.

BLACKBERRIES.—The Snyder, but many will grub them up, as they sprout so badly.

RASPBERRIES.—Gregg. The most prominent reds and yellows are not liked.

STRAWBERRIES.—Crescent and Cumberland. I think Haverland the coming strawberry for my garden.

GRAPES.—Concord and Delaware. We had very few this year. FROST!

From D. E. Hoffman, Winchester:

In reply to your questions I will simply give the names of a few of the leading varieties.

Apples, for market, I will name Ben Davis, Smith Cider, Twenty Ounce, Grimes' Golden, Maiden's Blush, St. Lawrence, English Hagloe, Red Astrachan, while for family, such varieties as Rambo, Belleflower, Early Harvest, Strawberry, Fall Wine, take the lead. This year White Pippin, Smith's Cider, Grimes' Golden, Maiden's Blush and Twenty Ounce bore the heaviest crop of fruit, which was mostly of inferior quality, owing to scab and insects.

Pears all done well, while Flemish Beauty took the lead. Bartlett and Hoenshenck have done well. I think the crop of Flemish Beauty was the finest ever grown in this section. Mt. Vernon, Seckle, Tyson, Sheldon, all bore a full crop. While I might be doing some varieties injustice to discriminate, yet I can hardly refrain from saying a word of praise in favor of that comparatively unknown kind, the Hoenshenck, which has fruited on my grounds for several years, the fruit being large, of fine appearance and good quality. The tree, an upright, thrifty grower, and bears early. I noticed blight on several of my trees, its first appearance for several years.

Plums were only a partial crop, confined mostly to the native varieties, as the rot and curculio took about all my Lombard, Jefferson, Green Gage, Washington, Coe's Golden Drop, leaving me some Wild Goose, Bassett and Robinson. While the Robinson lacks size, it does not fail in number, ripening for six weeks a small, but rather fine plum, equal to most of the wild varieties. Owing to the frequent

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showers spraying did but little good, and I can hardly determine whether it is effective or not.

Peaches bore abundant where there were trees old enough to bear, but being outside of the peach belt, I have not sufficient acquaintance with varieties to give the names. However, the Roser you sent has fruited this season with me, and I find the fruit good size, good quality, and ripened the last of October.

Cherries, a large crop, mostly Early Richmond and Morrello. I had some very fine Montmorency and Olivet, with some others to hear from.

Grapes mostly rotted. Concord, Ives and Hartford still the varieties giving best results. However, I had some very fine Niagara and Worden, while the old Isabella has done about as well on a five years' average as any variety I have. The Duchess you sent me, the vine has grown less every year, while I have some bearing vines of the same, but do not consider them of much value.

Blackberries have done well. The kinds doing the best and are mostly cultivated are the Snyder, Kittatinny and a few Lawton. The Wilson, Jr., sent me for experiment, bore a full crop of good-size berries, some larger than Snyder and quality about the same; plant, however, is tender.

RASPBERRIES.—About the best thing sent me for trial is the Nemeha raspberry. It is a good grower, an abundant bearer, while the fruit is large, looks very nice, and is of good quality. The Gregg, Mammoth Cluster, Ohio, Cuthbert and Shaffer are cultivated, and all have their friends.

STRAWBERRIES.—Of the dozen or more varieties sent me for trial and have fruited this season, with the exception of the Haverland, which has done very fine, none have proved of much value. The Logan, Photo, Norman, Gandy and Monmouth are no better than the Crescent, Cumberland or Jersey Queen. I left no fruit on the plants received last spring, but the plants nearly all have made a good growth.

The Downing gooseberry gave an abundant crop. I like it better than the Mountain Seedling.

CURRANTS.—The Fay's Prolific is still doing fine. The Wilder has fruited some this season, but not sufficient to determine its value.

From J. T. Moss & Sons, Ashboro:

There are no apple orchards in this county planted for market purposes. Each farmer, of course, grows for his own use, and some years has a surplus, but with no purpose or system as to sale. He generally plants whatever variety the tree agent advises. Ben Davis seems to be a general favorite at present, though but few trees of this variety are now in bearing. In our own orchard the crop this year is 75 per cent. of that of '88, but is of little value for keeping purposes, all varieties apparently rotting alike.

No orchard of pears, a few trees here and there. The Duchess is our favorite. This had a full crop in '88, with perhaps 50 per cent. this year.

Plums the same as pears. The Wild Goose is a general favorite.

CHERRIES.—The Early May is almost exclusively planted for home use, a few Dye House and Montmorency being planted these last few years. The Morello bore an unusually heavy crop this year, the first full crop in ten years. Prices very low—30 cents per gallon.

But very few quinces grown.

Currants are not extensively grown, not enough for home consumption. The Red Dutch is the only variety in common bearing. The frost nearly destroyed the crop this year. Prices were 10 per cent. higher than last year.

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Gooseberries same as currants, except the failure was more nearly total.

BLACKBERRIES.—Snyder is the only variety cultivated; this gave an unusually good crop this year. Prices ranged about two-thirds as much as last year.

Gregg, Tyler and Turner are the varieties of raspberries mostly cultivated. One-quarter more than last year and prices one-quarter less.

STRAWBERRIES.—Crescent mostly grown, with a short crop both years, not more than 50 per cent. of a full crop. Prices very high both years, with an increase of 10 per cent. for this year.

DISCUSSION.

*Prof. Troop.* You will notice that only in one report is there mention of quinces being grown. I would like to know whether it can be grown here successfully or not.

*Walter J. Ratliff, Richmond.* In the eastern part of the State I have seen trees that bore quinces; two or three dozen on each tree.

*W. A. Workman, Greencastle.* I had a few orange quinces this and last year. The first few years I set my trees out they would winter-kill, but now, for two or three years, they do not seem to kill down. If they winter-kill in this latitude, I wonder if they don't suffer from winter in the north part of the State.

*Mr. Thomas.* Last year I set out a dozen orange quince trees and last winter they did not kill down.

*Secretary Hobbs.* Mr. William Mustard, residing near this city, is growing the Missouri Mammoth. I would be glad if Mr. Mustard would tell us something about his success.

*Wm. Mustard, Indianapolis.* My trees are young, having been set but four years. This is the first year they have fruited. Some of the trees had five or six quinces on them, and they were fine. This quince needs to hang on the tree until the middle of October before maturing, and will bear some freezing. Those specimens that were gathered for the fair were taken a little too early to show the color and quality well. I had one that hung on until the first of November and was well colored.

*C. M. Hobbs.* Have you been troubled with the blight?

*Mr. Mustard.* A little, this season, but quinces should have a little salt, annually. I salted a little this fall.

*J. G. Kingsbury.* How do you apply it?

*Mr. Mustard.* Scatter broadcast; one-half pound to the tree.

*J. A. Burton.* Did you salt all your trees?

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*Mr. Mustard.* Yes, all my quinces.

*Walter J. Ratliff.* I would like to ask Secretary Hobbs if there has been a greater demand recently for fruit trees of this kind over the country?

*C. M. Hobbs.* The demand for quinces and peaches has greatly increased the past three years, due, I think to the milder winters. If we have a severe winter this winter there will be less demand for the peach, quince and other tender trees the coming season.

*James Little, Hendricks County.* While attending the Illinois State Fair last year, on the street leading to the fair grounds my attention was directed to a patch of quinces. I went to the gentleman who owned the orchard and inquired how he raised them. He informed me that he made it a practice to mulch with coal ashes and ashes from the blacksmith shop, and claimed that it was a success. I have been trying that myself, with reasonable success. I also use salt; it is good for the quince.

*Professor Troop.* Do I understand that the quince is as tender as the peach and that is the reason they are not raised here?

*C. M. Hobbs.* Yes I think that is a fact in Central Indiana.

*Professor Troop.* How is it that they raise them in Western New York? I am sure they have as cold winters as we have, and they raise an abundance of quince there but not many peaches.

*Dr. Chas. C. Cornett, Madison.* Quinces are commonly grown in Southern Indiana. You will find quite a number grown in Decatur, Jefferson and Clark counties, but not grown for market, but rarely find a garden without a quince or two. I have known them grown for market, and successfully, but of late years they rot like the apple. What causes the rot, I am unable to state; they rot before ripening. In my own garden I have a few quinces and my neighbors have also. The tree is more hardy than the peach.

*C. M. Hobbs.* The quince is not grown to any extent out of the belt in which the peach grows. In the central part of Indiana they winter-kill badly. We planted 150 to 200 fifteen years ago and have one tree standing; they were winter-killed time and again until the roots died or were grubbed out. In regard to growing them in Western New York, near the lakes

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they grow many varieties of fruits we can not grow here. Varieties of apples, pears, plums, etc., that will not endure our climate are profitably grown there. I was told by a Michigan peach grower that the peach buds would often endure a temperature of eighteen degrees below zero; here as a rule, they will kill at ten degrees below zero. In a latitude where the quince can be grown it does best in a cool, moist soil.

*J. A. Burton, Lawrence County.* In our section of country we think the quince is hardy. They generally do not bear very full, but enough for family use. We raise the Orange quince. As to the Champion, I never saw it growing only on Mr. Beard's ground. In August last it was bare of leaves.

### DISCUSSION OF THE RASPBERRY.

*E. J. Howland, Marion County.* My Mammoth Clusters were scattering this year, so much so that I told them not to go in to pick them. My Greggs were fine; they were growing side by side.

*J. G. Kingsbury.* Is the Gregg to be superseded by any other kind of raspberry?

*Prof. Troop, Purdue University.* In our locality there is a better kind, the Namaha; it is better and hardier. The Gregg winter-kills. The Namaha is firm and as large as the Gregg. Its season is late. So far as I know it yields as well as the Gregg. I find the Gregg is reported the greatest number of times from the different stations, so I consider it doing well.

*W. A. Workman, Putnam County.* Do I understand you to say the Namaha ripens about the same time as the Gregg?

*Prof. Troop.* It is one of the latest I have.

*E. J. Howland.* I have raised the Gregg for nine years. I have the original stock yet, and have not failed to raise a good crop. They have not winter-killed. A year ago last winter there was a heavy sleet on the ground, the furrows filled with water, but the same season there was not a cane killed beyond where they should be cut back.

*J. A. Burton.* Mr. Howland claims the varieties generally do not run out of age. My Greggs, in six years, have deteriorated. I have heard they would run out in five or six years. I want to hear if you have had any experience in that way.

*E. J. Howland.* I had a good crop of raspberries from the first original plant nine years old. I have as good a stand of canes as anybody.

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*J. C. Ratliff, Richmond.* I was among the first to plant the Gregg around Richmond. I paid three dollars for one hundred plants and multiplied them until I put out one-fourth acre. I did not want any other, as it bore enormous crops. I do not remember the time, but eight or nine years ago. Twice in that time my canes have been killed down in the winter to the snow line. Those below the surface or top of the snow were all right. For the past three years (perhaps it is partially due to want of cultivation) they have been deteriorating. Last year I plowed them up. Up to that time we had Gregg raspberries. We did not grow other varieties to any extent, so I have not had an opportunity to compare them with other varieties so as to form a correct conclusion as to their productiveness with other varieties of raspberries. But for four or five years, with proper cultivation, I have found nothing to equal the Gregg for productiveness. I can not help liking them, but I think they are becoming more tender and are deteriorating.

*Mr. Burton.* Have you tried new patches?

*Mr. Ratliff.* My son is putting out a patch and I want him to try other varieties. I have the Golden Queen and some others I aim to test, but for quantity and quality I go back to the Gregg raspberry.

*Fielding Beeler.* I have had some experience in this line. They uniformly winter kill. The Gregg has been an unsatisfactory berry with me. My soil is very similar to that of Mr. Howland's.

*J. G. Kingsbury.* I am trying the plan of mulching. I want to know how to apply and what amount to put on.

*J. H. Vajen, Indianapolis.* In the year 1881, a number of families from Indianapolis visited Lake Maxinkuckee, in Marshall County, Indiana, on a branch of the Vandalia Railroad; the object was to purchase lands or lots, and to cultivate, beautify and build upon and occupy them in the summer months. The purchases were made and improvements began without further delay. The three acres of land I purchased contained about one acre of low muck land, bordering on the edge of the lake. The black muck was from ten to fourteen feet deep, with springs every where under it, and it was too low to ditch it sufficiently, there not being fall enough for that purpose. We therefore dug shallow ditches from six inches to one foot deep, and placed fence boards in the bottom, on which we laid

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five-inch tile. The object of placing the fence boards under the tile was to keep the tile from sinking out of sight, or rather to the bottom of the muck, which was very soft. After covering up the tile slightly, brush was laid all over the ground from one to two feet deep. On top of this we placed from one to two feet of straw. This gave us sufficient footing or firmness for our teams to transport sufficient subsoil from the adjoining high land to cover the straw about a foot deep. After which we made ridges about four feet apart, of rich soil, then visited the nurseries of Messrs. Albertson & Hobbs, and James Sanders, and with their assistance selected such trees and small fruits as we judged best suited to that climate and place. These were mostly planted on the land described. The first year the growth was not extraordinarily thrifty, but the second and third year, when the plants got their roots down to the water, or rather moist earth, the growth was wonderful, and now for the past two years we have had astonishingly large crops of berries, both in size and number. Warm, cold, wet or dry weather does not apparently change the result. We selected for blackberries the Snyder for an early, and the Taylor for a later variety, thus furnishing us this most valuable fruit from the first of July to the middle of September. The new shoots or stalks require to be cut back several times during the summer, being of rank growth. I have let a few stalks grow as an experiment, and they attain the hight of from ten to fifteen feet, with branches in the form of a tree, and were called blackberry trees by neighbors and friends. I also planted two rows of the Taylor blackberry on ground on an elevation of about thirty feet above, but very near the low land. The ground in which they were planted was cultivated very deep, and mixed with leaves from the forest. Although the soil was not rich, still by mulching them every fall they grew large and produced an abundance of the finest fruit, but ripen earlier, and the crop does not continue so long, which is caused by not having sufficient moisture to support a crop, especially in a dry season.

The raspberries selected and planted were the Cuthbert, Turner, Shaffer and Golden Queen. All are very prolific and furnish us during their season the finest berries. They receive about the same treatment as the blackberries, except that they are not thinned out so much, the stalks not growing so large as blackberries. After the berries are gathered the old stalks

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are cut and thinned out, which gives the new shoots a better chance to grow.

Having a large number of shade trees and a small forest adjoining this ground that produce such an abundance of leaves that must be disposed of, we rake them together and mulch the berries and trees with them to the depth of six inches to a foot and cover them with about one half to one inch of soil to hold them in place. It is my opinion that forest leaves contain more nourishment, give more protection against frost and will retain more moisture in summer and keep the land in better pulverized and mellow condition than anything else we may apply to berries or fruit trees.

I have also planted currants, strawberries and gooseberries, plums, Russian mulberries, cherries and Transcendent crab-apples on a part of this same soil, and they are beginning to bear, having furnished us the past summer with excellent and perfect fruit.

*Mr. J. A. Burton.* We cultivate our raspberries two years; trim in the spring or latter part of winter. We mulch always with straw for two reasons: First, if we depend on plowing or hoeing it is too apt to be neglected; second, in case of drouth you don't have a failure of berries. I am aware that if you cultivate well, the loose top soil acts as a mulch, and that is the best method for growing berries on a large scale. Mulching is then not so practicable. But I would cultivate for two years that the roots may not be too close to the top of the ground. We place the mulch so that it is three or four inches deep after it is settled. When we trim we do not clean out the old canes, we consider them good mulch and cover them up with the straw. I mulch before the canes put out leaves in the spring. If you defer this until the shoots start you are liable to break them off. In regard to growing berries in water, I know they will to some extent. I remember when in the army, while stationed at Mobile, going out on the breast-works, where the rebels had thrown up a dam, water had collected some two feet deep, covering, probably, a hundred acres, I used to walk from log to log picking grapes growing through that water, and gathered blackberries, jumping from sod to sod. Berries will grow sometimes in places where it is wet, but generally they require dry land. As to trimming, I trim in the winter as a matter of convenience.

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*Mr. Kingsbury.* What is your obejction to mulching now?

*Mr. Burton.* Mulching would do no good in winter.

*Mr. Henby, Hancock County.* I have a small patch of Gregg raspberries, and have a white clay soil. Before planting my patch I drained it well. It was an old timothy meadow, seven or eight years old. I hauled straw and manure from the fair grounds in the fall after cutting my meadow, covering the ground thoroughly. In the winter I let my young hogs run over the patch when the ground was not frozen, they rooting it up. I broke it deep in the spring and set my plants the usual distance apart, rows seven feet and three feet in the row. I cultivated well that summer. In the fall I mulch with the same kind of manure I used before breaking. The next spring I trimmed my plants, cutting them back, and I thought that I had as fine raspberries as any in the State. I have kept up that mode of culture ever since, and have had three crops of berries, but this season I notice the cane dying back, especially where the ground is low, this occurring before cold weather set in. I can not account for it.

*Mr. Thomas, Grant County.* I have not succeeded well with the Gregg raspberry, because I have it on clay soil, but I have a neighbor who planted one acre five years ago this spring, and the last crop was the best he ever got; they grow better all the time. He planted on new ground, old blue-grass sod, and give extra good cultivation, and so far has had good berries all the time. His soil is rather a warm soil, ordinary sugar tree and walnut land.

*C. M. Hobbs.* It is an established fact that the Gregg will succeed in dry, warm soils and not in a heavy, wet soil. Raspberry plantations should be renewed every five or six years I think, to produce the best results.

*W. A. Workman.* I want to say that it is the prevailing opinion that if we have raspberries out six or seven years, that if we plant new patches we get larger berries; but I am surprised that we have a man who has raised them for nine years successively, and that they are still giving good crops of fruit.

*E. J. Howland.* I once took this mulching fever, after growing them four years without mulch. I mulched them fairly well, but could not see any improvement; next year I mulched them, and there was a perceptible failure. I plow under and cultivate like corn, and get good vigorous canes. I am not

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sure whether the patch is nine or eleven years old, they possibly may be eleven, at least the original stools are there.

*Mr. Workman.* In cultivating in the same place so long, don't the plants stand on too much of a ridge?

*Mr. Howland.* No, I take a bar plow and throw a furrow from them, and then throw back to them. If you have observed in plowing a field you will see you can throw out at one plowing what you throw in with two furrows. On the same principle you don't get the ridges too high.

*Mr. King, Wayne County.* I am acquainted with Mr. Ratliff's patch that he quit cultivating. I put a patch out at about the same time he set his. I cultivated them and last winter mulched with straw, and never had better berries. I think if Mr. Ratliff had mulched he would have had strong canes. I think mulching protects them and keeps the ground loose. The Gregg raspberry on Jesse Stephens' land is a failure. His land is black swamp-land, reclaimed, but on our clay land the Gregg raspberry will last as long as we take care of it.

*C. M. Hobbs.* As an extreme case of the effects of mulching I know a gentleman in Rush County who has a small patch of Miller's Daily planted thirty years ago. The ground has not been cultivated. He applied leaves and scrapings from his yard, year after year, and the patch has kept up its vigor and health, producing good crops annually.

*Daniel Cox, Hendricks County.* I have a small patch of Gregg, the first I set out, standing on the hill close to the creek bottom. The patch is some seven or eight years old; I never have plowed them, but take the old canes out and mulch with straw or leaves. This year we had large, fine berries. They grow on a yellow, sugar-tree soil.

*James Little, Hendricks County.* We can not say too much for mulching, especially with forest tree leaves. There is something about forest leaves that is highly beneficial. They always hold moisture in time of drouth and we get better and more berries.

*S. H. Frazier, Danville.* My experience with the Gregg, at first, was not very satisfactory. I tried several years, but failed. They were on black, loose soil, and they either winter-killed or were killed by hot weather. I finally planted on high land, a little on the wet order, manured in the fall and set in the spring. They are now four or five years old, and I never saw

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nicer ones in my life, and no sign of winter-killing. I use a bar plow, throwing the dirt to them in the winter, so as to drain the water from the plant, and throwing it back in the spring.

*W. A. Workman.* I am in favor of mulching, and always with fine, pulverized soil. If we can cover up all the brush by mulching it is an easy way of disposing of it. If we mulch we can plant close together. Mr. Burton, what is the distance of yours?

*Mr. Burton.* I plant seven feet.

*Mr. Kingsbury.* Perhaps Mr. Workman's plan is good, but I think the mulching plan is best.

*Mr. Ketchum.* Autumn is a better time to mulch, so the leaves will then decompose somewhat and act as a fertilizer.

*C. M. Hobbs.* I think I see serious objection to covering up the brush, which may contain insect eggs or injurious fungus.

*E. J. Howland.* I think we should burn the brush. By that means you get rid of many insect pests that you would not if you leave on the ground. Mulch applies to small patches, but not so well to large ones.

*Mr. Hobbs.* When berries are grown in a small way it is safe to recommend it, but for field culture, except for strawberries, it is too expensive and impracticable.

James Little was called up to explain a device.

*James Little.* The peach tree is not a success in this country if it stands up. For growing trees in a way that they may be lain down and protected against cold, an idea occurred to me to take a piece of tin or zinc, making a trough by curbing up the sides (exhibiting a model), placing this in the ground; place the tree in this, letting the roots run out at the ends of the trough; drive a stake beside the tree, to which it is tied. There is a slot cut in one side of the trough so as to admit of the tree being bent to the ground, when it may be protected from the rigors of the winter. In the spring raise it up, tie it to the stake, close the slot in the trough. It is a new invention of mine, and I have no doubt but that it will work successfully.*

*S. H. Frazier.* I had some young peach trees old enough to bear. I planted them near a bank, dug a little trench and cov-

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*Mr. Little is having a quantity of tile made in which to grow trees on this plan. He has applied for a patent.—SECRETARY.

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ered with dirt and killed every tree. Afterward I saw a man lay them down and cover with corn fodder and had peaches every year.

*J. C. Ratliff.* Several years ago a man came to Richmond selling a patent for protecting tender trees. We used to lose our peaches by late freezing. He mound up some three feet around the tree. Some of our people were raising some fine kinds and got him to superintend this mounding up. After he got the dirt raised around the trees he would bring the limbs down to the loose ground and cover lightly with dirt. There were a few trees treated in that way which bore fine specimens of fruit, but mounding up high was a violation of nature's laws and orchards died out. I do not know but what there is something to come out of this idea of my friend Mr. Little. I one time had my grape arbor fixed so I could lay it down, and when I did this I got a good crop of grapes. The idea is to preserve the fruit buds from severe freezing.

*Mr. Henby.* My experience is, if we get the tree on the ground that is sufficient protection.

*Mr. Taylor, Indianapolis.* For several years I cover up my grapevines with earth, on the theory that the earth will take out the frost without injury to the vine. In reference to peach trees, I will say that I lost one hundred trees and I came to the conclusion that peaches were an uncertain crop and peculiarly so in our climate. I do not look with favor upon this plan of pulling down; I would rather let it stand. If you put down at all put under ground.

Prof. W. H. Ragan, of Greencastle, submitted, as Trustee, a report of Purdue University.

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## REPORT OF PURDUE UNIVERSITY (INDIANA AGRICULTURAL COLLEGE.)

BY W. H. RAGAN, TRUSTEE.

On the 2d day of July, 1862, Congress passed an act, of which the following is the title: "An act donating lands to the several States and Territories which may provide colleges for the benefit of agriculture and the mechanic arts." I quote the title of the act for the purpose of directing attention to the supposed special character of such schools. Under this act our State received land script, which was sold, by an order of the trustees, for a sum of $212,238.50. This amount was sub-

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sequently increased by sale of bonds and reinvestments to almost a quarter of a million of dollars at the time of the organization of the University.

Judge Purdue's original donation, for which he claimed, and did receive, the name of the institution, was $150,000, and citizens of Lafayette and vicinity secured its location by adding to this the further sum of $100,000.

Legislative appropriations for buildings, etc., have since aggregated the larger half of a million of dollars.

The school is now well up in its second decade of active existence. Its buildings and equipments are quite complete; its grounds are ample and admirably situated, and its campus is unexcelled in its aesthetic features, though greatly lacking in the scientific arrangement of its rich and varied flora.. This, however, could not well be otherwise, since the chief design of the campus must be its ornamental effect. To offset the absence of proper scientific arrangement, and to make the campus, as far as possible, a school of information to the student and visitor, a system of labeling trees and shrubs has been ordered, which will compensate, in a measure, for its defects in this direction. No time, however, should be lost in laying the foundations of a well planned arboretum, which should, as far as possible, include specimens of all hardy trees and shrubs, especially of those belonging to the rich native flora of our State.

### A FRIENDLY CRITICISM.

Aside from the campus, the horticultural conditions at Purdue are hardly worthy of our great State, especially in view of the prominence this branch of agriculture should have in an institution having its very foundation stones resting upon the just claims of agriculture and its kindred branches, and which, from the inception of the good work in 1862, has called forth such liberal public appropriations and private bequests. The School of Horticulture in Purdue scarcely has an existence other than in name, and the plat of ground now devoted to horticulture is of such recent planting and is so obscure in its location, that a guide must necessarily point out its whereabouts and its proportions to enable either student or visitor to fully realize what and where it is. Truly, horticulture at Purdue is not what we could desire.

The salary of the Professor of Horticulture is not in keeping with the salaries paid in the other departments, and his work seems to be appreciated only as it pleases the eye of the admiring public. The benign influence of horticulture should be more fully recognized at Purdue, else Indiana horticulturists may justly complain. A larger share of the immense public patronage showered upon this institution is due the, to us, paramount interests of horticulture. Modesty is a Christian virtue, of which I believe horticulturists as a rule possess a fair share; but we may sit idly by and forfeit our just rights to be heard in the control of matters of public policy, which so intensively concern us as do the questions under consideration.

In justification of the above criticism, I need only say, that of the 397 students now enrolled at Purdue, but two are known to be giving special attention to horticultural studies, and (including these two) only twenty-six are taking the agricultural course. While there is much to commend in the work at Purdue, these conditions lead us to question whether, after all, the Institution is not falling short of our most sanguine expectations? Is it not time for us to stop and inquire into the causes that operate to defeat our long cherished desire to see horticultural education a practical reality in our State?



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This Society (as also the writer) is now, and ever has been the true friend of Purdue, and among the most hopeful of great good resulting from its existence. Therefore, the friendly criticism must not be taken as a stab at the Institution, nor in the spirit of mere grumbling, but it is given in the sincere hope that it may help bring about a better and more prosperous condition of its affairs generally, and especially of its horticultural conditions. Neither would I impugn the motives, nor question the ability of the Professor of Horticulture, whose efforts have thus far failed of the desired results. He has, beyond doubt, given his best and most faithful service to the work assigned him.

DISCUSSION.

*J. A. Burton.* I believe Prof. Ragan will have to inquire why so many boys leave the farm. Perhaps our people are not so thoroughly worked up to horticulture as they should be. We should spend some time in getting ready to do something. Moses was eighty years in getting ready to do something. We should teach our children in this important industry. In reference to strawberries, while Prof. Troop recommends many varieties, I would ask whether most of these varieties are successful for market purposes?

*Prof. Troop.* I think not. It depends much on the soil and locality. The Downing does not do remarkably well with us, but it is the main berry in the vicinity of New Albany; so it depends largely on the soil situation. If I were recommending varieties on our ground I could pick out eight or ten that I would plant in preference to others.

*Mr. Burton.* Suppose you were planting a patch for commercial purposes, what kind would you plant; not receiving a salary from Purdue University.

*Prof. Troop.* I would plant Crescent, for commercial purposes, but for general purposes, Warfield No. 2, that is as hardy as anything on our ground, prolific, of good color and good quality.

*Mr. Burton.* How about firmness?

*Prof. Troop.* Perhaps not quite so firm as the Crescent. Logan is good. Haverland is new, but it is good with us. I do not like to recommend these new varieties until we test them on our grounds a few years. The Jessie, in some localities, is good, but I can not recommend it. The Crawford is good and one I would specially recommend, and it does not blight.

*J. C. Ratliff.* What objection do you have to the Jessie?

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*Prof. Troop.* It is not more prolific than others and is quite liable to be killed by late frosts. Last spring it was the only one injured by frost.

*J. C. Ratliff.* It was very popular, when first introduced, with us, and I think it bore some of the finest fruit I ever saw, but last spring a year ago the bloom was all killed on the Jessie strawberry. It starts early in the spring, throwing up fruit stalks in time to catch the frost; otherwise, it is as fine a berry as I ever saw.

*C. M. Hobbs.* From some peculiar formation of flowers some varieties are more susceptible to injury from frost, while there seems to be an inherent ability in some varieties to resist more cold than others.

*Mr.* ———. Has any one had any experience with the Hattie Jones?

*S. H. Frazier, Hendricks County.* I went to see the Hattie Jones strawberry on Mr. Carter's grounds, near Clayton. It was on low, black ground. After it was in bloom the mercury fell below freezing. While he had few berrries on anything else, the Hattie Jones was loaded with fruit. It was growing alongside the Crescent, Russell, Sharpless, and several other varieties.

*Mr. Mann, Illinois.* The Bubach is excellent for table use, but in visiting a number of plantations I found the new beds of this variety had little fruit, while old beds were bearing themselves to death. It seemed to be the general plan, and many are getting shy of it.

*Mr. Thomas.* On my place, out of eight varieties the Crescent was ahead. The Belmont, Green Prolific and Bubach were ahead of the Jessie, which was killed by frost.

*James A. Little.* Will the Crescent bear fruit without fertilization? Some say that it will. It occurs to me that it does some. I have some plants which have been growing for a number of years, several rods away from any other plants, and bear nice berries. I understand Mr. Hobbs to say that it will not.

*Secretary Hobbs.* I think you are misinformed, because I do not know certainly. It would take careful experimenting to test that beyond question, because the flowers are exposed to fertilization from other varieties by the wind, insects, bees, etc., and you would have to put the Crescent under glass or canvas to test whether it will fruit without pollen from other plants.

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*Prof. Troop.* I have covered the Crescent so that nothing of the insect kind could get in or it could in any way receive foreign pollen, and it will bear a little.

*Prof. W. H. Ragan.* As fertilization of fruits differ with the species, now in the case of the strawberry the fruit has a receptacle which must be fertilized in order to produce at all, but in the case of the banana and Japan persimmon they have been improved upon, and the same way with pears and oranges at Riverside, Cal. The Navel orange don't require to be perfect flowered. Our native persimmon will bear fruit without fertilizing. I have an instance of a tree which my father planted. When it came into bearing it proved to be pistillate, and there were no staminate trees within six miles. Quite to my father's surprise the tree bore perfect fruit without seed. In the course of a few years a specimen now and then would have seed. The inference is the pollen must have been carried in the air six or eight miles, but recently other trees have come in bearing, and they bear a large per cent. of seedless fruit. Some eight or ten years ago I was at Topeka, Kansas, attending the State Fair; an old gentleman interested in fruit brought me a plate of persimmons and said they grew without seed, which was to him quite a curiosity. I told him I could explain that; the fact was he had no staminate trees near. I presume if he has staminate trees he is now raising persimmons with seed.

*Mr. Burton.* I understand we develop the persimmon with fertilization, but not the strawberry.

*W. H. Ragan.* If I understand, a strawberry is not a berry, but a receptacle, corresponding with the cob as to an ear of corn. With the persimmon it is different, the seed would more nearly correspond to the berry, probably.

*Mr. Mann.* No, it would be as an apple.

*Mr. Ragan.* The methods of fertilization are very different, and sometimes imperfect. Corn cobs form sometimes with no grain on them. This is much the condition of the strawberry, one pistil may be fertilized and others not, having the same condition as the corn with the imperfect ear.

*Mr. Mann.* In the case of the persimmon and strawberry, the seed of one is on the inside and the other on the outside. Nature has a purpose for it. We must not interfere with nature in her development.

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*W. H. Ragan.* The design of nature in producing seeds is to reproduce the species. In case of this native persimmon, the fruit was imperfect without the fertilization of the seed, but that was an accident of nature, but the development of seedless fruit can be accomplished by man. In the direction of certain results you care nothing for the seed of the apple, so you agree to avoid that by reducing the number. Going back to the original of our apples you find many seed, but some of the highly cultivated varieties are almost or quite seedless.

*S. H. Frazier.* I have three bearing persimmon trees this year, and all seedless. Now and then a seed, but they were rare.

*Mr. Mann.* Where you grow persimmons without seed you get better flavored and better persimmons. This, in our locality, has been a favored year for the Bellflower apple, some of which had not a single seed.

*J. C. Ratliff.* I would like to hear a few remarks on the subject of the plum. I think we could spend some time profitably in discussing that subject.

*J. A. Burton.* We have the Wild Goose, but it bears shy; enough for home use. We have also the Blue Damson, which bears quite well.

*Nathan Harvey.* I want to know what kind of blackberries to plant beside the Snyder.

*Prof. W. H. Ragan.* Since last meeting I attended the Minnesota meeting in January. The subject of blackberries was discussed at length and ably, and I was surprised to find the sentiment so general in favor of the Snyder. I expected to find Stone's Hardy and Ancient Briton at the head of the list, but there were none ahead of the Snyder. In our neighborhood, in the vicinity of Greencastle, the Snyder has succeeded well, and so has Stone's Hardy. Both are regarded favorably about Greencastle, but the preponderance is in favor of the Snyder.

*Secretary Hobbs.* The Snyder, Taylor, Ancient Briton and Stone's Hardy are most extensively grown in the west and northwest. The Snyder more extensively than all the others, perhaps.

*Prof. Troop.* I did not say anything about Stone's Hardy, but I gave a list a few weeks ago in the *Indiana Farmer.* Among them was the Snyder, first, followed by Taylor and Ancient Briton. The Minnewaskee and Erie are the most promising of the newer varieties. The Erie is considered by some not hardy, but with us it is hardy.

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*James Little.* I have got the Stone's Hardy, Snyder and Taylor. I have another which I think is a seedling of the Kittatinny. It has rather scattering seed. I did not give much attention to it and it bore well year before last. Last year I never saw such a row of blackberries in all my life. Off of a row a little longer than across this room I gathered seventy gallons. It is undoubtedly a seedling of the Kittatinny.

The meeting adjourned until 7:30 o'clock P. M.

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## Evening Session.

"Advantages of Ornamental Planting" was the subject of a paper by E. Y. Teas, of Greenville, Ohio, which was read by Secretary Hobbs.*

### ADVANTAGES OF ORNAMENTAL PLANTING.

This is a very broad subject to assign to a small man.

Advantages are nearly equivalent in some cases to uses, and I have in mind instances of some of the uses of ornamentation, which are to open the blind eyes, and set people to thinking, to teach persons to notice things, and to comprehend some of the beauties of nature that at all times surround us.

I had occasion in the spring of 1889 to make an extensive planting of flowering bulbs near a large school building, on the street where hundreds of young people passed every day. The planting embraced thousands of showy gladioli, hyacinths, montbretias, etc. As the plants grew, they seemed to attract much more attention than an acre of cabbages or potatoes would, and when the flowers began to appear, great interest was manifested in the minds of the children, and many learned the names of the particular varieties who had never cared so much for flowers before.

The same piece of land was again planted with the same kinds of bulbs, with others in the spring of 1889 and their growth and development closely watched by the same students. Now many knew not only which were gladioli, but also which of these were Lemoin's Hybrids, and which of these gave the finest flowers.

The educational effect of this object lesson was very marked, and the train of thought, and habit of looking for things thus started, will have its good influence in many minds through life.

I have often been surprised at the little notice persons of ordinary education and intelligence took of the new or novel forms of vegetable or animal life met with in strange localities, and how easy it is to interest persons in the new things that surround them.

Traveling once with a party of land seekers from Pennsylvania in southeast Virginia, where holly, magnolia, cypress and other rare trees abounded, and where the exposed marl beds showed many beautiful shells and fossils, it only needed to

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*Mr. Teas was asked to prepare a paper on this subject about the time of his removal from the State. He hadn't time to treat the subj ct as he desired, but sent this short paper rather than fail entirely, with the request that we not publish it. We think it worthy of a place here. SECRETARY.

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have one's attention called to these objects of interest to awaken an enthusiasm that contrasted strongly with the indifference so apparent before, an interest that made men wide awake, and watchful for objects curious or novel to carry back to their friends at home.

Even the Texas cowboy can be tamed, and made companionable by inciting in him an interest in the plants he has been galloping past for years without seeing them. So I claim any person and every person may be made wiser, happier and purer by a further acquaintance with the uses, beauties and advantages of ornamentation.

DISCUSSION.

*W. H. Ragan.* I was sorry to learn of the loss to our State of so valuable a man as Mr. Teas. As a resident of the State I feel especially so in addition to the fact of his real worth. He with myself and a few others are the only charter members of this society living. I am pained to learn that we have lost this citizen and member; but I am glad to have this paper from him; it shows the high range of observation exhibited in a quiet way. I was reminded by the reading of the paper of a trip I took not long since with a highly educated lady teacher of some years' experience, and finding how really lost she seemed to the beauties of nature, the botanic features that were a constant source of delight and pleasure to me; I found that she took little interest in these objects as well as those that were simply attractive to the eye. She expressed a deep regret that she had neglected the study of botany in her school-days, and was entirely lost and could not distinguish between the remotest species. This has been one of my difficulties in life, the lack of a thorough knowledge of botany, but I have acquired something by close observation in a loose-jointed way. I want to make this statement for the benefit of those young people here. The study of botany not only helps us to see the beautiful in nature, but it is useful as well. I want to say in this connection that one object in rising to my feet was to move that Mr. Teas and Dr. Furnas be made honorary members of this society.

Motion carried.

*C. M. Hobbs.* This subject is of interest and importance, and should have considerable discussion. I have thought for several years that we should give the subject of horticultural aesthetics more prominence on our program, and that we should get some one who made a specialty of landscape gardening to give practical suggestions as to the best manner of

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laying out small places and with light expense. Something in this line would be helpful and interesting to us. I would like to have this question discussed quite fully.

*W. H. Ragan.* We need not devote too much time in meetings of this kind to this particular branch of horticulture. We should give more attention to the various branches of horticulture if we expect to get up an interest of this kind. Our society was first organized as a pomological society, the same as Michigan and Ohio. It was found that such did not cover the ground fully and that horticulture embraces a wider field; instead of continuing it the pomological society it was changed to horticultural society. To make our homes attractive is one feature of life we should not neglect. The paper has opened up that field, and perhaps it might be well to discuss it to some extent.

*J. A. Burton.* There is another question in connection with this subject of which I will speak. We should interest our children in the love for the beautiful. It seems to me that the children might be learned much at Purdue, in this respect. Most all of us are farmers, and know but little about flowers. I must acknowledge that I do not know much about ornamental planting or flower gardens. In fact, I do not know how to enjoy it as some would, but my nature is uncultivated that way. The wild morning glory has a fascination for me that I can not describe. When I see them growing in profusion I feel electrified. Sometimes when I am shipping my hogs and cattle to Cincinnati my wife wants to know if I don't go to see the morning glories, which are so abundant this side of Cincinnati. In Florida, during the war, we had little to do. The General was interested in ornamental planting, and we had orders to ornament our grounds around the bay. We spent six weeks ornamenting the camp. People would come along and wonder at it, and look upon our ornamental grounds with admiration.

*Mr. Hobbs.* I feel interested in having our school property ornamented. Some of our school houses and surroundings are extremely uninviting. We need something of this kind done. We have, in some localities, given this subject special attention, and made considerable planting of trees, shrubs and climbers, and improved the property materially. But in some localities this spirit has not manifested itself yet. There is much room for missionary effort in this direction.

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*Walter J. Ratliff.* Ornamental planting don't include flowers alone, but trees and shrubs. Flowers would do around home, but trees on school grounds are considered ornamental, and has been before the people for several years, and greatly increasing as years pass by. I think the Governor, who has signified his intention, will more forcibly bring this before the people by requesting trustees to see that their grounds are more properly ornamented with various trees, such as sugar, ash, elm, and other varieties. Another thing in this connection, the farmer should improve his waste land by planting trees that will shade his ground, and still be a profit. I set out over fifty locust trees for growing fence posts, but the borer almost destroyed them. The Russian mulberry is a good grower, but can not be used for fence posts. While the wild locust is good and durable, it is uncertain in growth. Trees should have protection. Stock will crowd under the shade of trees during the heated term of the year. The farmers should have convenient places under which stock may take shelter from the sun in such times of year.

*W. H. Ragan.* It is difficult to estimate the effect on the young that the ornamentation of school buildings may bring about, especially on the minds of children. I have often thought that Purdue University had a beautiful campus. The students there, many of them at least, give little or no attention to the surroundings, passing carelessly along, but after awhile they will look back to the surroundings of that institution, the variety of plants and trees, and take advantage of that knowledge for their own enjoyment and amusement. I once said to a young man, in a horticultural class, in regard to this particular matter, that it is hard to tell what useful termination might come from the then apparently useless lessons, as they might seem to have no relationship to after life. I illustrated it by saying that "some of you young gentlemen may become owners of places of your own, in the future, and in laying off and ornamenting your grounds your knowledge may be useful in directing the work and what to plant, otherwise you are at the mercy of men disposing of trees, who may be inclined to impose on you, and in laying off and making walks and drives at your expense. But if you get the principles of landscape gardening here, you know whether he is doing it right or not. Without some knowledge you are liable to be imposed on."

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Dr. Stockbridge, of Purdue University, read the following paper on "Changes in Quality and Composition of Fruits Through Application to the Soil:"

## CHANGES IN QUALITY AND COMPOSITION OF FRUITS THROUGH APPLICATIONS TO THE SOIL.

BY PROF. H. E. STOCKBRIDGE, DIRECTOR EXPERIMENT STATION, LAFAYETTE.

Fruits, being products of vegetable existence, consist, as all vegetable matter must, of two classes or kinds of material of which they are composed, and from which they are formed as products of the life functions of living organisms.

These two different kinds of matter are designated as organic and inorganic or mineral. Agriculturally, however, they may be appropriately considered, from their origin, as atmospheric matter and soil matter. Between these two wholly different groups of substances, unlike in origin, characteristics, composition and functions and uses, there exists a definite and fixed relation on which the character of the product largely depends.

Few fruits contain less than 98 per cent. atmospheric matter, or more than 2 per cent. of soil ingredients. The latter exists solely in ash, and occurs chiefly in the seed, skin and stem.

The organic constituents of fruits form a considerable number of compounds to which the chief characteristics of the fruit, the flavor, texture and aroma are due, among them being starch, sugar, gum, gelatine or pectine and the albuminous constituents, together with the all important organic acids, illustrated by malic acid of apples, the tartaric acid of grapes and citric acid of lemons and gooseberries.

Small as is the comparative proportion of mineral matter present in common fruits, and important as are the relative quantities as effecting the significance of the organic substances, there seems to exist a definite and fixed relation between these two classes of substances in all fruits, and though we recognize commonly only the influence of the organic substances as imparting recognized properties to fruits, the character of these latter constituents is not only greatly influenced by the mineral matter present with them, but may really depend on the character and composition of the latter.

The composition of the organic fruit constituents depends directly on the character of the mineral matter present in conjunction with the same, and consequently, though the atmospheric constituents may be directly and individually beyond control, their dependence on the soil ingredients places to a certain extent the definite means of positive control of fruit properties directly in possession of the cultivator.

The relations known to exist between these two unlike classes of matter become, therefore, of paramount importance, and of direct practical value in controlling the properties of the product sought.

Before endeavoring to exert this control, therefore, let us briefly review certain relations and facts established as existing in this connection.

All vegetation contains compounds of both organic and inorganic matter, of which two classes of material plant nutriment must, therefore, consist. But what-

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ever may be the nature of the material entering into the composition of plants, or to whichever division of matter it may belong, no vegetable growth possesses the power of assimilating simple or elementary material, with the single exception of the element oxygen. With this one exception, therefore, no elementary body, however important a position it may hold in the plant organism, can be considered as direct plant food, or can under any condition be, in a free state, assimilated by the plant, or even assume the form of vegetable nutriment.

Only combined material is capable of furnishing the plant with sustenance, and, hence, soil compounds alone bear any direct relation to the growth of plants.

Though all living bodies consist of two distinct classes of matter, organic and inorganic, combustible and non-combustible, plants feed only on inorganic matter, as such, posessing the power of transforming inorganic matter, carbonic acid, water, ammonia, nitric acid, into organic matter, or combustible carbon compounds, by recombination, as the result of the life-function of the vegetable organism.

As the inevitable result of this relation between these two different classes of matter, their mutual dependence each is absolutely essential to the growth of the plant, one as necessary as the other, and, without the presence of both in sufficiency and assimilable form, plant-growth is impossible.

It is now an established truth that not one of the indispensable constituents of the nutriment of a given plant possessess greater importance for that plant than any other such ingredient; for, without them all, the action of each is impossible, and the absence of one renders all the others ineffective as producers of normal or healthy plant-growth.

The organic ingredients of vegetation are chiefly the five compounds, starch, sugar, cellulose, fats and albuminoids. The composition of the four first, or non-nitrogenous compounds, consist of some modification or combination of the elements carbon, hydrogen and oxygen, whence they derive their designation "carbo-hydrates;" while the albuminoid material contains nitrogen as well. These materials all result from the combination within the plant of the inorganic compounds, carbonic acid and water, with the addition of nitrogen in the case of albuminoids, in which phosphorus and sulphur are also present in minute quantities.

The process of organic synthesis thus conducted by the plant is briefly this: The carbonic acid of the atmosphere constantly surrounds and bathes every part of the exposed plant. Coming into contact with the green leaves, it enters the pores or stomata with which the under surface of the leaf is covered. Here, by the action of sunlight, a process of reduction follows, resulting in the liberation of the oxygen of the decomposed acid which passes out of the pores to again become mingled with the atmosphere, thus purified, while the carbon remains behind, and, combining with the water of the plant-circulation, forms the carbo-hydrates of which the plants so largely consists.

Not only does sunlight prove to be indispensable to the process of assimilation, but the green coloring matter of the growing tissue, known as chlorophyl, is even requisite to the transformation; and is evidently the direct means for the combination of the carbon extracted from the atmosphere with the inorganic constituents of water.

The first and direct product of this combination is generally starch, though possibly sugar may be the first actual product of the union, remaining invisible, however, because of its solubility in water or cell juice; and in certain plants, the onion for instance, being the final product as well, starch remaining wholly

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absent. Whichever of these carbo-hydrates, even though it be fat, may be the first and direct product of this union of inorganic matter with atmospheric carbon, the entire series may be formed by subsequent oxidation. By variations in the relative proportions of the three factors, carbon, hydrogen and oxygen are produced.

The actual chemical transformation wrought may be expressed as follows:

| *Water.* | *Carbonic acid.* | *Cellulose or gum.* | *Oxygen.* |
|---|---|---|---|
| $5\ H_2O+$ | $6\ CO_2=$ | $C_6H_{10}O_5$ | 12 O liberated. |
| $15\ H_2O+$ | $18\ CO_2=$ | $(C_6H_{10}O_5)_3$ | 36 O liberated, starch. |
| $6\ H_2O+$ | $6\ CO_2=$ | $C_6H_{12}O_6$ | 12 O liberated, glucose. |
| $11\ H_2O+$ | $12\ CO_2=$ | $C_{12}H_{22}O_{11}$ | 24 O liberated, lucerose. |

It becomes evident therefore that from the starch resulting from the assimilation of carbon, sugar, gum, oils and cellulose, the entire organic mass of the plant is produced as the result of the life-function of the organism.

Moreover, though the conversion of starch into other carbo-hydrates, for instance, glucose, may be artificially accomplished, the plant is endowed with powers not successfully imitated by man, namely, the conversion of sugar into starch, cellulose or fats.

The albuminaceous, protein or nitrogenous plant constituents are the result of the action of nitric acid on non-nitrogenous compounds, probably sugar with the elimination of carbonic acid and perhaps water, though direct combination for albuminoid formation is not probable, intermediate or amido compounds being the direct product of the decomposition. The definite method of combination still remains in doubt, and is best summed up with the statement that "the synthesis of organic nitrogenous substances within the plant is a function of the living protoplasm in which material the entire process occurs."

The extraction of nutriment from the soil and the assimilation of this nutriment depends directly on the processes involved in the utilizing of atmospheric constituents, since plant-growth results only from the combination of the two for the formation of new cell matter. The office of actual absorption of soil matter devolves upon the mesh work of roots penetrating the mass, and is accomplished through the cell walls of the root. And this food must exist in the form of solution, since material only in this form is capable of entering the plant and combining to become a constituent of its organism.

That different soils possess widely varying crop adaptations and power of crop production are facts of universal acceptance.

That fruit properties vary, within certain limits, with soils of adjoining regions of identical climate and aspect, is hardly less generally recognized.

The cause, however, lying in the varying composition of the mineral soil ingredients, the preponderance or lack of certain constituents through the activity of which a controlling influence on the character of the fruit product, is too generally but half recognized or utterly lost sight of.

The dependence of the organic fruit constituents on the character of the mineral food to which the plant has access is fully accepted, but the definite relations existing between each individual organic plant constituent and every one of the elements of soil origin remain still but imperfectly understood.

Average cultivated soils are, however, recognized as furnishing all plants growing on them with a sufficiency of all their purely soil constituents, with the exception of the two substances, potash and phosphoric acid. The latter is known to exert its chief influence on seed production and to lend little influence in determining other plant characteristics other than to be essential to normal development.

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Potash remains, therefore, the one soil material of most vital importance, and concerning its action on the plant, particularly the relations existing between this substance and the organic plant constituents, our actual knowledge is most complete.

The relation existing between potash and the starch content of plants is most intimate, and the ultimate transformation of this vegetable product into the ultimate form of sugar is now known to depend in a great degree, indeed to be proportional, to the potash supply to which the growing plant has access up to the limit of normal development—facts well established by the protracted experiments of Dr. Goessmann at the Massachusetts State Experiment Station.

We have already seen that from the original starch formed in the plant, all other organic carbo-hydrate products of vegetable life are derived by subsequent transformation. It therefore follows that any influence exerted over the starch content is of necessity indirectly extended to all derivatives of this constituent. To these derivatives the typical characteristics of fruits are due. Potash, therefore, possesses a direct and definite relation to each of the ingredients controlling fruit characteristics.

No attempt toward exerting an artificial control over these properties can succeed which does not utilize these fundamental principles.

Concerning the desirability of exerting this control there can no question exist, since it includes the improvement of quality and successful production where only failure could by natural means be the result.

Having now discussed the principles or laid down the theory, let us proceed to the demonstration of actual practice.

Recognizing the principles already discussed, their direct application in modifying fruit characteristics was attempted by Dr. Goessmann as long ago as 1876, grapes, strawberries, gooseberries and peaches being the fruits with which practical demonstration was sought. The results of the experiments then begun were given to the public in a paper read before the Massachusetts Horticultural Society at its annual meeting in 1882, and in every respect a transformation in the composition and qualities of the fruits experimented on was effected through the addition of mineral constituents of plant growth to the soil, the transformation being most marked with wild grapes, which by this means alone were made to almost identically correspond in composition and quality with certain varieties of the cultivated fruit, and with strawberries, the quality of which seemed to be by the means adopted almost positively controlled. This work, however, was directed more particularly toward a study of the mineral constituents of fruits.

Adopting the results obtained by this experiment as the basis of procedure, I have for several years been, through practical field trial, studying more fully the actual relations existing between fruit mineral constituents and their co-existing organic constituents, to which their recognized properties are due.

Apples and grapes have been the two fruits toward which attention has been particularly directed, and some of the practical results demonstrated I now take occasion to record.

Apple trees fifteen years old were supplied with raw materials yielding seven pounds of available potassium oxide, the end directly in view being the observation of the action of the mineral essential of plant growth on the organic constituents of the fruit, to which flavor and aroma are due.

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COMPOSITION OF EXPERIMENT APPLES.

| | Water. % | Organic matter. % | Ash. % | $P_2O_5$ in ash. % | $K_2O$ in ash. % | Free acid. % | Sugar. % |
|---|---|---|---|---|---|---|---|
| I. Fertilized . . . . . | 86.21 | 13.56 | 0.22 | 6.45 | 23.96 | .44 | 6.34 |
| II. Unfertilized . . . . | 85.55 | 14.27 | 0.17 | 7.00 | 15.06 | .33 | 5.13 |

Although the total amount of organic matter in the fertilized fruit was less than in the unfertilized, the fact that sugar, the chief organic constituent, both in quality and in influence, in determining the characteristics of the fruit, exists in sample No. 1 in a quantity far in excess of its content in No. 2, is evidence that the comparative valueless organic constituents, starch and cellulose, have, by the well recognized action of potash, been transformed into the most valuable and characteristic organic constituent, sugar.

The work attempted with apples was repeated with grapes, the method of procedure being based on the well-known action of potassium compounds in modifying to a considerable degree the quantity of sugar elaborated by fruits, as demonstrated by experiments in Germany and particularly at the Massachusetts Experiment Station, and by my experiments with apples.

Although the quantity of sugar present, as already shown, is but one factor in controlling the characteristics and quality of the product, it is extremely probable that the organic constituents of the fruit might be modified in like degree with the sugar, and by the same means.

GRAPE ANALYSES.

| | Water at 100 C. | Ash. | Sugar in whole grape. | Sugar in juice. | Free acid. | $P_2O_5$ in ash | $K_2O$ in ash. | Spe gr of juice. | Ratio of acid to sugar. |
|---|---|---|---|---|---|---|---|---|---|
| I. . . . . | 83.56 | 0.266 | 10.93 | 13 09 | 0.70 | 15.29 | 50.72 | 1.066 | 1:18.70 |
| II. . . . . | 83.89 | . . . | 11.38 | 12.58 | 1.10 | 13.25 | 46.47 | 1.067 | 1:12.24 |

The application effecting these results being made at the rate of 0.3, –0.4 lbs. of potassium oxide (equivalent to from 3½ to 4 lbs. of hardwood ashes per vine).

But the utility of the grape depends chiefly on the character of its juice, whether for the wine-press or table. And here important and interesting facts are presented:

Analysis shows that, although the unfertilized grape contains slightly the most sugar, it contains at the same time far more free acid than was the case with either of the treated samples. The ratio of acid to sugar being, with the unfertilized, 1 part of acid to 12.34 parts of sugar in the juice. The case with No. 1, however, is remarkable, the ratio being 1:18.70 (an actual difference of 6.36, equivalent to a proportional increase of 51.54% through the treatment followed).

Aside from all interest attached to the facts demonstrated concerning the mutual relations between organic and mineral plant constituents, the actual result of the analyses is to show that, by the method of treatment followed, the ratio of acid to sugar has been increased from 1:12.24 to 1:18 70. This is an actual comparative increase of 51.54% in the value of the grape, while the actual increase, as related to the grape growing itself, may be far greater, even, in certain localities, a change from absolute failure to positive success.

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**These are the practical results obtained through the treatment and investigation of three successive crops with two entirely different kinds of fruit, grown under unlike conditions and on different soils; the results, however, practically coincide, and point toward one deduction. Perhaps they can not be considered, however, as furnishing positive proof, but give the strongest possible indications of the existence of facts of vital importance to every fruit grower.**

**As to the individual application of these indications, special elaboration is not necessary. They seem to indicate, however, that a new and positive method of control over the quality of fruits exists, which must, of necessity, render the grower, to a certain extent, independent of unfavorable conditions and inclement seasons and climate, and moreover show the reasons for a fact universally recognized.**

DISCUSSION.

*James A. Little, Hendricks County.* It is a fine production. I have been experimenting for a few years with ashes and manure to see what effect it would have on the land. Two years I selected four Ben Davis trees on which I tried this experiment; last year they bore five or six bushels; this year they bore some ten bushels. My orchard is on thin land, what I call oak land. I went to the mill, got ashes and selected four trees, the rows running north and south. I gave one tree a half load of ashes and half stable manure; the next tree I did not give anything; the third tree I gave a good coat of ashes alone, and the fourth I gave manure alone. I have watched the result carefully and I can not see any difference in the bearing, size or color of the fruit or quality. There is but one marked difference in the tree. The first tree I gave manure and ashes, the foilage is a shade darker. So far as I have experienced I do not see much encouragement to go ahead and dose the other trees. Two of those trees had no pruning; one headed out low; the other that I gave ashes and the one I gave manure are just alike.

*Professor Stockbridge.* There are two things which account for this variation. The gentleman said, I believe, that his soil was sandy.

*Mr. Little.* No; clay soil.

*Professor Stockbridge.* The greater amount of sand in the soil the less is the effect of potash. Potash affects sandy soil less than other kinds. The valuable ingredient is excessively soluble; this sandy soil leaks and does not retain the valuable properties of the potash, so much required for the growth and development of the tree. It is a fact that the roots of a tree extend to twice the height of the tree, then all the trees, manured and unmanured ones, near by received the benefit of

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this fertilization. If you apply one material to one tree and another material in the same row to another tree, each tree gets the benefit of these fertilizers applied, simply because the trees were so near together that the roots of the trees run together.

*Mr. Little.* My trees were thirty feet apart.

*Mr. Mann.* The application of ashes is beneficial, but I think results would be different on different qualities of soil.

*Professor Stockbridge.* It depends much on the location. The soil itself contains potash in a greater or less degree, so conditions alter cases. On the actual condition of the soil it might give certain results on one soil and different on another.

*Mr. Burton.* Do you understand the potash develops the quality of the apple to its full extent?

*Professor Stockbridge.* We are here to compare experiences. This was the actual result of my experience, and my impression is, the solution is not only the amount of potash applied required for the ordinary development of the fruit, but potash possesses a certain definite action on the starch of the fruit. I can take an ordinary sour apple and by the mere use of potash can produce one almost sweet to the taste, and so with grapes; in the course of four years, by the additional application of potash, are transformed in quality almost equal with the cultivated grape. So this thing is not fully understood. I give this as my impression that actual change is to be attained by the supply of what is ordinarily required by the plant and after the plant has taken up what it required, then if excess is given it will produce transformation in the character of the fruit. We should apply different amounts and see the different results from such application. We do not know yet what quantity to apply to produce the best results, nor what the cost would be, but it should not cost much, as ashes are cheap.

*Mr. Ragan.* Suppose you take the seed and propagate this, would not the result be an improvement on this particular grape?

*Prof. Stockbridge.* That would be the probability. The best seed produce the best results. If we take seed from the best quality of grain or vegetables they possess *certain qualities*, and we expect these qualities to appear in the new plant.

*Dr. Cornett.* At what season would you use ashes, and would you use nothing but hard wood ashes?

*Prof. Stockbridge.* I have used sulphate and chlorate of pot-

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ash, wood ashes and saltpetre. Improvements in results was attained with all kinds of potash. I apply in the spring, just before the buds start, and put on broadcast, apply to the surface and cultivate in with the hoe.

*J. A. Burton.* In regard to the quality of strawberries. This last season the Crescent produced for six weeks abundantly, which is twice the ordinary season. The last three weeks of this yield was after excessive rains, and there was a great improvement in the quality of the berry. The Crescent is usually sour, but after the rain they were sweet.

*Dr. Stockbridge.* I believe it is reasonable and quite probable that the result was simply owing to the action of potash, which is soluble in rain water. Now, then, in the condition stated there were several days of rain, and often no rain, but dry; during the few days of rain the soluble potash in the soil become dissolved in the waters of the soil. As long as there was rain it was dissolved and worked down, and when the rain stopped, the solution was coming up to the surface; the water evaporated in such soil, in other words it was exactly the same as the formation of saltpeter in a rainy season. Just as soon as the rain stops, evaporation works it upwards.

*W. H. Ragan.* The discussion of this subject has been very interesting and instructive. The professor has just come among us, and this is the first of our meetings that he has attended, and I hope we may have many occasions of his return to our meetings, when we shall be always glad to hear from him.

*J. A. Little.* In the southern part of Indiana they know it is absolutely necessary to use some kind of fertilizer. They use immense quantities of commercial fertilizers and it produces wonderful results. They go quite a distance and pay a big price for it. Where I live we have a great variety of soil, but in many places there, where comparatively nothing has been raised, by the use of fertilizers they are producing big crops.

*Mr. Hobbs.* Has Professor Stockbridge had any experience with the use of peroxide of iron as a fertilizer?

*Prof. Stockbridge.* I have, but chiefly on flowers. However, from a practical standpoint, it may be accepted as a rule that peroxide of iron is of no use under ordinary circumstances. So far as obtaining beneficial results, it is so much money thrown away. It has been used sometimes to change color, which is the only thing of practical importance. There is a



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fertilizer called Peroxide of Iron sold at the schedule price of about $28 per ton, which is really not worth more than $2 per ton.

Adjourned until 8:30 A. M.

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**Wednesday Morning Session.**

DECEMBER 4, 1889.

"What Horticulture Is, and What Horticulture Has Done," was the subject of a paper read by Professor W. H. Ragan, of Greencastle.

## WHAT HORTICULTURE IS, AND WHAT IT HAS DONE.

"Nature is made better by no mean,
But nature makes that mean; so are that art
Which you say adds to nature, is an art
That nature makes."—*Shakespeare.*

Hon. C. L. Watrous, of Iowa, ex-President of the American Association of Nurserymen, has truthfully said: "There is probably no other subject resting so near to all our daily lives upon which there is such a general lack of intelligence as that embraced under the generic term, horticulture." Webster tells us that horticulture is "the art of cultivating gardens." This is a brief, but not sufficiently comprehensive definition. During the last half century horticulture has outgrown the circumscribed limits of the garden.

Horticulture is that branch of agriculture which embraces the kitchen and floral gardens, the nursery, the orchard, small fruit culture, the vineyard, the work of the landscape artist, the arboretum, the care and management of green-houses, artificial forestry, park and cemetery adornments, etc., etc. In short, horticulture follows closely after the architect and builder, clearing away the debris falling from the workman's chisel and the artisan's hammer. It smooths down the rough places, supplies us with luscious fruits and healthful vegetables, and surrounds our homes with the pleasing landscape, the beautiful lawn and grateful shades. Horticulture plans and plants, tills and harvests and otherwise directs and cares for the fruit and vegetable gardens, the orchard, the vineyard, the lawn and the roadside and street trees, so comforting to the weary traveler and so pleasing to the eye of culture and esthetic taste.

In the language of the immortal bard of Avon, horticulture "is an art which does mend nature." The arts of horticulture may be scientifically performed, though the *art itself* has not yet reached that degree of perfection when we may justly claim that it is a true science. Its relations, however, to many of the sciences, especially to that of botany, are very close, and without a fair understanding of these we can not hope to attain eminence in the pursuits of horticulture.

The progress of horticulture has necessarily been slow. Great skill and painstaking have characterized the laborers who have wrought the wonderful changes which mark the progress already apparent in this interesting field of human industry. The triumphs of horticultural arts consist in moulding, to a certain ex-

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tent, nature's plants and their products to suit our fancies and our tastes. The botanist finds in the plants of nature the perfect types of their respective species. For his purposes, in analyzing and determining its genus and species, and assigning it its proper place in the great families of plants, he would select the type least removed from a state of nature, and never the products of the art of horticulture, which are, to some extent, manufactured products.

In an uninterrupted state of nature all plants are disposed to reproduce their likeness from seeds, there being but little tendency towards variation in their offspring. So long as nature plants and prunes and trims, and so long as nature's conditions and surroundings exist, this tendency to reproduce the natural types continues. The crab, in its native habitat, the south of Europe, is still a wild and almost valueless species, notwithstanding the fact that through the manufacturing processes of the art of horticulture our noble apple is its lineal descendant. And so of most all our luscious fruits, our handsome flowers and our esculent vegetables. They each bear the impress of the art of horticulture. Each has been taken from its native habitat, and through the winning arts of horticulture, led into captivity and into companionship with man who "plants and prunes, cultivates and grafts, and creates new fruits and flowers," for in all reverence, is not the pippin or the pearmain a manufactured article?

In the economy of nature, the great and paramount effort is the reproduction and perpetuation of the species. To mature the germs of reproduction in the greatest profusion and in the highest state of perfection, is the first aim and purpose of nature. To this end all plants are endowed by nature with fecund principles highly developed. They are also, in many instances, clothed with offensive and defensive, or even with aggressive characteristics and habits, which enable them to successfully struggle with the great world of nature for existence or mastery. The thorns of the wild crab are its offensive and defensive armor.

But seeds and germs are, in many instances, of secondary importance to the horticulturist, since they are valueless only as they serve his purposes in the production of new varieties, his arts and acquired skill enabling him, when once a desirable variety is produced, to perpetuate it without again resorting to seeds.

### THE PROCESS.

The various domestic species have been taken from their native habitats and from their wild surroundings and, by the horticulturist, subjected to the ameliorating influence of his arts. At first but slight impressions were manifested. But the process went on. Generation after generation of seedlings showed but little deviation from nature's types. By and by varieties of marked characteristics began to appear. Seeds from those showing the most desirable variations from nature's types were planted, and in turn their offspring was again and again planted and cultivated and fruited.

### AN ILLUSTRATION.

As a fitting illustration of how this process has been conducted we will take the potato, which, prior to the discovery of America, was a wild, unknown species growing in the mountain valleys of the Andes. The tubers were small, and quite valueless as an esculent vegetable. Its first introduction into Europe was by the Spaniards, early in the sixteenth century, and, as remarked by Chambers, "only to be cultivated in a few gardens as a curiosity, and not for general use as an article of food." As late as 1719 a British author asserts that the potato "is inferior to

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radishes." As a matter of fact, the horticulturist's first interest in the potato seems to have been as a flowering plant. Having failed to attract attention in Europe as a garden ornament, it was a third time reintroduced, by Sir Walter Raleigh, after which it was yet a long while before its culture became general. In the meantime it was being propagated from seeds that in each case produced new varieties, which, under the varying influences of garden culture and changed climatic conditions, perceptibly affected and improved the offspring. Thus the potato has been domesticated and improved, and that largely within the memory of men now living, from its wild, almost valueless condition, in the mountains of Western America, until now "no food-plant is more widely diffused" and more universally valued in all temperate parts of the globe.

Much of the work of improving our domestic plants, whether ornamental or useful, has been the result of chance and unsystematic culture. It is perfectly natural that such should have been, at least for a long time in the beginning. No scientist or expert propagator had gone before leaving the results of his experience and teaching the lesson of acquired skill. Each individual operated as an experimenter in his own way, and after a fashion peculiar to himself. That they should have planted from the seeds of the best within their reach, and that they should have given such culture as to their minds promised the best results, is only to suppose that they were endowed with intelligence commensurate with the period of their existence. We can thus readily realize why there is still room for progress in this interesting field, although centuries of patient labor are now numbered with the past.

### MORE CERTAIN AND RELIABLE METHODS.

That all human knowledge is based on the experience of the past, is true in horticulture as in other vocations of life. Experience has taught us that in propagating, with certain objects in view, we must select our type and follow it down through generation after generation before we can hope for the realization of our ideal. Neither must we lose sight of the influence of culture and artificial conditions on the maturing germ if we would hope for the most rapid strides in the perfection of our ideal in the offspring. Downing says: "The process of amelioration begins with a new generation and by sowing the seeds."

Enjoying the accumulated experience of preceding generations, Prof. John Van Mons, of Lourain, in Belgium, early in the present century began a series of experiments in the origin and improvement of varieties, which had its basis in the systematic care and selection of the germs to be used in propagating new sorts, which were, in turn, again to be used as the parents of other generations. His plan contemplated the rapid carrying forward of this work, beginning with the type of the species nearest the original, and which, in his judgment, possessed greater native vigor and health, and by choosing the first maturing seeds of the first desirable fruit for planting for a second generation, and so on. In this way he would, as he believed, soon produce desirable new varieties. While there is still a large element of uncertainty as to the results of this method of breeding, there can be no doubt that Dr. Van Mons was eminently successful in giving to the world a large number of valuable new sorts, especially of the pear, with which his experiments were principally conducted.

Cotemporaneous, in time, with Dr. Van Mons' experiments in Belgium, Mr. Thomas Andrew Knight, of England, was operating through another and somewhat more certain and highly scientific method of producing new and desirable varieties. His plan was to use the seeds of fruits, the flowers of which had been

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artificially fertilized. The offspring of these would be hybrids or crosses, and were found, in practice, to possess many of the qualities of one or the other, or possibly both parents. Mr. Knight has had, and still has, many followers in every department of horticulture. Hybrids and artificial crosses are now quite common. Indeed, with our present facilities, our skill in "manufacturing" new varieties, fashioned after our own liking, is scarcely bounded by the limits of our whimsical tastes, for

"Art is nature made by man,
To man the interpreter of God."

### PROPAGATING A SPECIES.

By the foregoing it will be seen that a species may only be propagated by the planting of seeds, the true germs of reproduction. If we plant a seed we produce a new individual of its species. By this reproduction and perpetuation of the species, the design of nature is subserved. The likeness of the parent has been reproduced and nature is satisfied. But variety pleases man. Under the magic of his influence varieties are produced, as has already been shown. But man is not yet satisfied. When a desirable variety is secured he wishes to perpetuate and multiply it beyond the limits of nature, for there are limits to the duration of individual organisms.

I have already shown how a variety may be produced. If a variety thus produced should prove desirable, we could only enjoy it during the lifetime of the individual tree or plant. When this was gone our variety, however desirable it might be, would have perished. To obtain another we would again be forced to resort to the slow and uncertain process of planting seeds. In this, as we have already learned, there would be many chances for deterioration rather than progress to manifest itself in the character of the offspring. But happily for us, we have already learned

### HOW TO PROPAGATE A VARIETY.

Varieties are propagated through a number of methods—some simple and inexpensive, while others require painstaking, knowledge and skill. The varieties of some species are self-propagating, others partially so, while there are others that must be propagated in a strictly artificial manner, and still others which require, in addition to skill on the part of the operator, an expensive outfit of appliances and apparatus.

The strawberry may be cited as belonging to the first class. When a desirable variety has been produced from the seed, it will multiply itself beyond limit if only given proper culture and encouragement. Each new plant is the same variety as the parent plant which produced it by sending forth its runner.

The potato will represent the second class. Its tubers, or each eye or bud thereof will produce plants of the same variety, but for practical purposes they must have help in their proper distribution.

The apple is a familiar type of the next class. Each bud, of a large tree, if skillfully inserted, by budding or grafting on a congenial stock, is capable of producing a tree of the same variety as the tree from which it is taken.

There are many trees and plants belonging to the fourth and last class. They are those difficult species which require the combined skill and apparatus of the professional propagator, with his artificial heat and glass structures. In addition to the above there are many intermediate processes such as layering, divisions, propagating by cuttings, etc., which enter into the practical operations of the horticulturist and propagator, but are too tedious to refer to in detail in a short address like this.

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There are no mysteries in the art of horticulture. It only requires skill and experience, with a fair share of intelligence, to enable us to succeed in the practice of her arts. To learn the art of grafting or budding, or even the more skillful operations of the professional propagator, is far less difficult than to learn to play Auld Lang Syne on the fiddle, and to become an expert would not rack the brain nor tax the patience half so much as to become a proficient in the rendition of a modern violin solo.

In propagating by grafting or budding, however, we will learn that nature has placed bounds and limits, beyond which we can not go. While we may materially change the habits of a species in the production of varieties and in their subsequent extension by propagation, we must follow the line of affinities in the selection of stocks on which to propagate. No human skill will ever succeed in causing a peach tree to grow on an apple stock. Nearly related species of a genus, as the pear, apple, quince, or hawthorn, or, as the peach, plum, apricot, and other stone fruits, can be used as stocks—the one for the other—but far better results may always be expected from the pear on pear, apple on apple, peach on peach.

### HORTICULTURAL TERMS—HOW CLASSIFIED.

Horticulture may be divided into professional and amateur, and again subdivided into the economic and aesthetic. A professional horticulturist is one who follows the business as a livelihood. From it he makes his living. He may be a nurseryman, an orchardist, a vineyardist, a florist, a small-fruit gardener, a landscape gardener, a park or cemetery superintendent, a vegetable gardener, or he may follow several or all of these, and yet he is a professional horticulturist.

An amateur practices horticulture as a pastime, and purely through his love and taste for the calling. He may produce fine fruits and handsome flowers in superabundance, and have and enjoy his beautiful lawns and landscapes, yet if the business does not partake of the nature of an occupation he is still an amateur.

Economic horticulture deals with the substantial and useful. The man who follows this branch of horticulture may be an orchardist a small-fruit or vegetable gardener, a vineyardist, or he may follow the branch of the nursery business, in which the trees and plants, entering into this class of callings, are propagated and grown for sale.

Aesthetic horticulture embraces the ornamental. Its field is floriculture, landscape gardening, and park and cemetery adornments. It may also include forestry, and indeed all branches of horticulture, even a vegetable garden, when arranged as it should be, with reference to its beauty and aesthetic effect.

Horticulture is agriculture intensified, boiled down, reduced in its operations to the lowest area, and raised to the highest degree of perfection in culture. It yields the largest per cent. of value on the smallest area cultivated. It thrives with the advance of civilization and culture, and with the enhanced value of real estate and its subdivisions into smaller parcels. Lands insufficient for successful agricultural operations, when devoted to horticulture, yield handsome incomes. Its products are sought after as population increases. Through its response to increasing demands, what were, only recently, luxuries are at present recognized as necessaries of life. Strawberries are now measured by the train load, as against the quart in the days of our fathers; grapes are in demand by the ton, and bananas find a ready market by the cargo. Epidemics are almost banished from our land, and general sanitary conditions are vastly improved under a regime which enables us to substitute a fruit diet for "hog and hominy."

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"Horticulture is," in the language of Dr. Ridpath, "the poetry of agriculture. It is also a pursuit calculated to cool and subdue the emotions and passions of men, long heated in the struggling marts of commerce and the red furnace of war. It seems to me that something of this sort is necessary, in the economy of civilization, to check the ferocity of unscrupulous progress, and to prevent the excited juices of development from bursting the rind of nature. In the shade of the garden man finds rest. There his exhausted powers revive. There he finds refuge from the clamor and jealousy of his fellowman; and better than that, a hiding place from the haunting shadow of himself.

"Horticulture is, *per se*, one of the most pleasant pursuits which men have ever followed. It brings into healthful exercise both mind and body. It neither racks the one nor wrecks the other. To the gardener—even the aged gardener—the aching bones, the stiffened joints, the distorted form and the hungry soul are still indefinitely postponed. The author of the twelfth chapter of Ecclesiastes did not select his famous type of decrepitude from the garden walks and coverts. The venerable horticulturist is anything else than that stiffened caricature of old age in whom desire had failed, and to whom the grasshopper had become a burden. Under the influence and recreations of such a pursuit, man hides his face in the bosom of nature, and learns to love the order of the world. He trusts causation, and believes in law; and the God whom he worships is the God of reason and peace."

DISCUSSION.

*Mr. Burton.* Do we understand that the strawberry, if left to itself, merely by quitting the cultivation of the ground, will always maintain its variety and purity as first produced?

*Mr. Ragan.* I think it would. There is no possible chance for change in the vitality of the variety.

*Mr. Mann, Gilman, Ill.* There are many things for consideration in this paper. The questions we want to consider most are those of the divisions of varieties. That of the individual is only division. We make separate divisions of varieties and species; this division depends on the specific definition in which we include them. For instance, in a plant of certain grasses we include a variety, but if it extends farther, we have a species. In this division the plant will reproduce a type, and in classification we specify that class. The individual is the unit after the division, and the life of the individual in the strawberry is maintained by the runner, the plum by sprout from the root, the gooseberry by layer and the raspberry by tip. They don't always continue, but where they do they never change only on the power of vitality. Potatoes run the same. To continue a variety is to plant the seed and reproduce a new individual with certain characteristics or classifications which would be a variety. I don't believe the strawberry would change only so far

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as a decrease of vitality in age. It has no increasing vitality. It has the strongest vitality on the start and decreases with age.

*E. J. Howland.* Will not potatoes increase in vitality for a term of years?

*Mr. Mann.* No sir, I do not think so. That kind of hereditary tendency is a certain tendency modified. We have plants and animals; the plant, no matter how strong, there is a hereditary tendency that can not be overcome. We can not breed Jersey cattle with Shorthorns successfully.

*E. J. Howland.* My experience with the potato is, they do not mature the first year from seed. The first year the tuber is small, the second year three or four times as large, the third year it doubles in size again, and requires four or five years from the seed to bring them to their best. I have some now four years from the seed, and were not called commercial potatoes until this year.

*W. H. Ragan.* This thought suggested by Mr. Mann is new to me. I am not up in the science of botany well enough to know certainly about this matter of individuals and varieties. The individual does disappear with age and degeneracy. We call, by his theory, the Ben Davis an individual and not a variety. All those things that produce from seed would produce similar to themselves, and that is really an offspring. According to Mr. Mann these would be varieties, while an apple would be an individual.

*James Sanders, Hamilton County.* I rise to make a suggestion in reference to the potato. I think that the seed potato does not mature until three or four years. The plant does not get full grown until that time. The first season it starts out from a small seed, and is weakly and slender, and the tuber is really a bud from the plant, which grows the next year, and keeps on increasing four or five years before it is grown. It is a matter that has been definitely demonstrated that the potato does deteriorate. I suppose that is true with plants generally. A few years ago I noticed in the exhibit of apples from California at New Orleans that the apples produced here were larger and finer in appearance. We might conclude from that fact by continued cultivation the vitality of the plant might be increased and the plant grow stronger.

*W. A. Workman.* Is this new plant or tree at its best when found, and is there no chance to increase the quality of the

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plant? Has the Ben Davis more vitality at first than afterward? On that theory we should increase the vitality by cultivation.

*F. I. Mann.* Vitality, as a term, means to us two things. The term vitality, as applied to animals, is different from that of man. We say of an animal, it has strong vitality, yet it is not as long-lived as man, probably. The vitality of man is to live an allotted time of three score and ten years, yet you would not say that he had stronger vitality than the animal. If these have the properties of reproducing and lasting for a certain time, it seems that fruits might do the same. We do not know what the longevity of varieties of apples in this country will be. It may be 75 or 100 years, we can't know that yet. The probability is the Ben Davis has not vitality enough to last 75 years. It has been here about 35 years.

*Prof. Stockbridge.* I do not know that I have much to say on this line in the way of comment. The paper of Prof. Ragan is full of interest and has called out a few points of very great importance. Fruit is more than a luxury, it is a necessity, in some cases. We can not give too much emphasis to this. I am almost a crank on this subject. For several years I have had fruit, in some shape, constantly on the table. A few years ago I was thought to be subject to a hereditary disease which seemed sometimes to almost deprive me of my senses, and at times could not do mental work on account of severe headache. It was suggested to me that I adopt a fruit diet, and I have eaten fruit every meal since and the result is good. Since putting this in practice neither myself nor family have been sick, and have paid no doctor's bills. I am not a vegetarian, but am in the habit of eating some meat. I believe we should use plenty of fruit, as I am of the opinion that it is conducive to good health. In the production of varieties there are many ways in which it may be brought about. We know that the object of the living animals is the reproduction of the kind. The fruit grows for the production of that fruit and for seed. The flesh of the apple is a protective mass around the seed. The fruit was grown to protect the seed; therefore, the end and object was to perpetuate that thing. The chief energy of the plant is to produce reproductive organs. If we could get rid of the seed, as they have in the Japan orange, it would be a great improvement. I have eaten hundreds of Japan oranges

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and never saw ten seeds. The Japanese have now ten or twelve different varieties, each one producing a different kind, and all without seed. We are trying this experiment, and if it is possible to get rid of the seed of the orange, as in Japan, we can get rid of that of the apple. If we can do this, we may improve the quality and size of the apple. We take the apple, and, after the flower has shed its petals, we insert a needle and burn out the seed organs. There are many things in which this change may be adopted. I have never attempted to preach anything that I did not practice myself. I have tried some experiments with grapes, of one of which I spoke briefly last night, but here is another thing which will affect grapevines in changing the character of the fruit. The theory is this: The roots of the plant take up the moisture and mineral substances from the soil; these are carried up to the leaves where they are elaborated and converted into plant food; it then descends between the bark and wood, laying on new tissue of wood, foliage and fruit. If we can stop the downward passage to the root we have all this above, dammed up and held for the benefit of the fruit. We girdle below the cluster of grapes, cutting off the downward flow by drawing a knife around the vine, and stripping off a small section of bark. The result is, this sap moves down between the bark and wood, and when it comes to this girdle all the sap that would have gone down to the roots stops, you save all that strength and it goes into the grape. This year I tried it on grapes growing side by side, trying on alternate vines; the result was I hastened the ripening of the fruit from eighteen to twenty days. This may be a matter of much importance when it comes to market value. There was also another change, it was this: Not only was the maturity hastened, but the increased nutriment going into the fruit produces a better quality of fruit, containing more sugar, than the vine that was not girdled. So, we have by this process a marked improvement in quality; you can tell the difference immediately. This is something worth looking after, and should claim the attention of horticulturists. Perhaps by hastening maturity and improving quality in that way, it is possible these qualities may be fixed in the variety. Some of you may say you spoil the vine by thus girdling the wood. The canes that bear fruit this year do not produce next year, and you cut them off and throw them away.

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*Mr. Thomas.* At what time do you do this girdling?

*Dr. Stockbridge.* Perhaps it is better after the time the fruit is about the size of a small pea.

*J. A. Little.* This girdling process was practiced by my father when I was a boy. He girdled a peach tree and that peach grew much larger and earlier. Some six or eight years ago I had a Hale's Early tree growing in my yard and I girdled it, taking a branch the size of a pipe stem, on which was set one peach. I took a ring of bark out and that peach grew right off and gained on the others, and never ceased growing until ripe. Peaches, after growing for a certain time, cease growing and form a stone, which is the hardest time on the tree. But in that specimen it never stopped growing to produce a stone but grew right on. It was two weeks earlier than others on the tree. When that peach matured it had no stone but a mere substance in the middle.

*A. Glenn, Columbus.* I wish to say a word in regard to this girdling business. Mr. Spaulding, of Illinois, has been in the habit of girdling apple and pear trees. I have visited Mr. Spaulding and seen his apple trees; have noticed his orchard several times; the trees, when young, did well, but after a while they died. I have tried this myself on apple and pear trees, but the results are unsatisfactory.

Dr. A. F. White, of Santa Rosa, California, was called on, and spoke as follows:

I am a native of Indiana, having been born in this State, therefore I feel at home among you, and certainly have a warm feeling for your State, but California has been my home for thirty-seven years. California has been so misunderstood in regard to its climate and soil that you will bear with me on a few general remarks on the State of California. I was here yesterday with you a short time, since then I have been somewhat indisposed and am at present under the influence of quinine, my head roars and my voice sounds away off. In order that I may not make a mistake, I have here a map of California on a small scale, showing a few of the different locations and climates of that country. Now, sir, one of the great excellencies of our country is, we have a variety of climate; beginning at the lakes and sweeping down and down we have every variety of climate and production according to the condition of climate we pass through. California has all those va-

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rieties of climate which you have from the gulf to the lakes. California produces a variety as great or greater than all the United States, raising crops the year round Here we have the great valleys of the Sacramento and San Joaquin Rivers, which empty their waters into San Pueblo Bay, thence into San Francisco Bay, passing out through the Golden Gate into the Pacific Ocean. This map which I present is small, as you can see, and does not show the locations as well as I would desire, but you have citizens here who have been in California and know something of the general features, if he has been a close observer. The pale red which you see here on the map covers an area of 40,000,000 acres, a level scope of country including the valleys of the Sacramento and San Joaquin Rivers. It is our great grain belt, where we produce our wheat, oats, corn and barley. Then the pale straw color represented here consists of 25,000,000 acres, and covers the foot hills, a valuable part of our country for growing and producing the orange and fig, and varieties of the chestnut. This is certainly a rich part of the country.

So we have an orange belt as well around Los Angeles in various directions to the northern part of the State. Our friends in Los Angeles dislike to acknowledge this fact, claiming that they have the only true orange belt in the State. The light color here consists of 12,000,000 acres, which is our timber belt. There grows our fir, cedar and oak. This is turned into pasture land, and is most valuable for pastural purposes. The drab comes in next, which is our mountain region, and includes 13,000,000 acres. Here are our high mountain peaks and great lakes. I believe if you will refer back to your geographies you will see that for every 350 feet of elevation we get into one degree of cooler atmosphere, so when you get 6,000 feet above the sea you get into quite a cold atmosphere. Here in Indiana a description of your climate would serve as a description for any part of the State. This is not true of California. A description of the climate fifty miles north of San Francisco would not be true of the climate ten miles from it. Either ascending the mountains west or east we get into a new climate, because of the principle that for every 350 feet you have one degree cooler climate. I can say that one of the finest sleigh rides I ever had was across the Sierra Nevada Mountains in January. I was taking my family with me. On traveling the first part of the journey, such a time as we had in mud and rain.

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When we got on the mountains instead of taking stages the next morning we found instead three six-horse sleighs waiting for us, with robes and bells, and with the finest of scenery. We had 100 miles made before breakfast time. As fine snow as I ever saw. This is explained on the principle I have already mentioned. I tell this to impress on your minds the wonderful diversity of climate in change of locality. This is our region of fine scenery, Mount Whitney rising 12,000, 14,000 or 15,000 feet above sea level. The light brown color on this map includes about 10,000,000 acres. This is mostly plain, and is a comparatively barren section of country. The soil is all good, but there is no rain to make it fruitful. The total area of California is about 100,000,000 acres, greater than all the combined area of New York, Delaware, New Jersey, Massachusetts, Rhode Island, Vermont, Maine, New Hampshire and the great State of Ohio. The length of the State from south to north is 770 miles and having over 1,000 miles of sea coast. The breadth is 330 miles. The orange product in 1888 was 1,250,000 boxes. An average box would be about 100 oranges to the box. The great brandy product of 1887 was 800,000 gallons. The annual product of wine for five years past reaches 16,000,000 gallons. The raisin product of 1887 was fully 1,000,000 boxes, and there were shipped to the East in 1887 16,000,000 pounds. The green shipments of California in 1887 were about 35,332,000 pounds. The fruit crop of that year in the aggregate amounted to $12,000,000. On some acres, under favorable circumstances, the vine in California has been made to produce fifteen and one-half tons; but this is not the rule; they produce usually about eight or ten tons of grapes to the acre. Then we have the largest almond, orange and vineyard orchards in the world.

On Senator Stanford's farm we are likely to have the largest fig orchard in the world. It was commenced last year and will be completed this winter. It will embrace perhaps about 1,200 acres, and I know of no other orchard in the world equal to it. I make this statement to show the importance of the interest in California. Now, as I promised yesterday I wanted to speak with some fullness of the enemies of horticulture, I will preface these remarks by this statement. So important was this fruit interest in the State of California that the Legislature established a Board of Horticulture some years ago, con-

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sisting of nine gentlemen appointed by the Governor, whose duty it is to prepare papers and hold semi-annual meetings around in different parts of the State. Last April we held one meeting near San Diego, in the southern part of the State. We also held one meeting in November at Fresno City.

I have not been in communication with the Secretary, as I have been moving about so much, and do not know where the next meeting will be held. These meetings are attended by from 300 to 500 fruit-growers, and these papers prepared by the members of the Board are read before the whole body of the convention, and then a free and full discussion follows. In Sonoma County, where I live, we have a society, and I have been Secretary for quite a while. We have from forty to sixty members. Our attendance is usually about fifty. Subjects of interest in horticulture are discussed, and information is imparted. We solicit speakers from abroad, and the meetings are most interesting.

Among the enemies of fruit with which we have to contend, one of the most destructive, and one which threatened the extermination of the fruit interest, is the white or coteny scale bug. It seems that it was first introduced into some garden of San Francisco from Australia. It is one-half as large as a kernel of corn split. The animal is of a light drab color with three legs, and has a horn or snout with which to pierce the tender twigs of the tree. Mr. Coben, who is good authority, says there are as many as 3,300 eggs under the house or scale which covers the insect. If you take this scale off you find little dust falling down, and if you put a glass to this you will find the dust to be eggs, and will produce an insect. So you can see how rapidly it will increase. It produces three broods every year. Your trees will be covered with this scale from the top to within two feet of the ground, and they are so thick one will lap over the other. I have seen all varieties of trees covered with them. Now we have the Australian gum. I have seen these beautiful evergreen trees hanging from top to bottom covered with the scale. I have seen the orange, the almond, pear, apple, fig and the very grass that grows on the earth white with the house of this insect. The grass was covered so completely that the cattle would not eat it. It increases with such rapidity we feel that we must get rid of it. Some dig the tree up, some cut off the top. We also applied chem-

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ical combinations, but it increased on and on until for one I made a sacrifice in orange and other trees of thirty-five acres to get out of the business. Others did the same. One of the finest orange orchards, some thirty years old, together with golden fruit of which the limbs broke, containing about 105 acres, was ruined by this insect. You will now find only four or five orange trees there. I saw it last May and learned of the terrible habit of that insect. We petitioned Congress a few years ago for relief. We succeeded in getting an appropriation to send an expert to Australia where this insect come from, and by dilligent search they found the lady bird and placed it in these orchards, and very soon all this disappeared; but in the course of two or three weeks, on examination, we found they had begun hatching out a new brood. The old insects died and the new were doing good work.

The next scale insect in importance is the red scale, which infests the orchards and seemed to defy all, but we found a little fly in Mexico, and introduced it there, and it was all we needed. You have seen the woolly aphis on your apple trees. This little insect is a remedy for that. The aphis, some writers say, are of two varieties; my own view is there is but one variety, and it gets on the limbs and tender bark, going down to the roots, making knots, and stays there during the winter. In the spring it grows a few days, matures, then separates and makes a new insect. In the fall it deposits eggs for the new brood the following spring. This little insect will pierce the aphis, and deposit an egg, then in three or four days that egg will hatch a little larvæ; as soon as it destroys the aphis it then goes in the pupa state, and comes out a little fly, which penetrates the back of the scale, sucks out his vitals and kills him. Then we have the Australian or black scale, which injures our olive trees. Our last Legislature appropriated $20,000 for this year, and we have a man in Australia looking after these scales. I have been told that on the public square of Chicago the coteny cushion scale abounds, and it may be that your orchards here may be infested, so you can recognize it when you see it and be prepared with the remedy I have mentioned. We also have the black knot on our grape vines. We are in the habit of growing our vines about three years, and then tie to a stake. We generally trim back to two buds on a stem, and we expect grapes on these.

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The black knot appears all through our vineyards but does not kill the vine. We are in the habit of lopping off branches of the vine, and the real trunk of the vine we tie up and make a shrub of it. In some localties of California the vine attains an enormous size. I have seen them eight or nine inches in diameter, and clear from the black knot. Why? Because they were permitted to extend their branches over trellises covering a space of a hundred feet; in this case the sap come up through the main stems of the vine and permitted to extend to the leaves and then return in a natural and healthy condition, the vine not being cut away. I believe this vigorous pruning the beginning of the black knot; if, so, the remedy is in growing less vines and have them run on trellises. Then we have what is termed by many, a little grasshopper that commits some depredations. Sulphur is a remedy for that. A disease has appeared in the last six years that has baffled all our experts. It is sometimes termed sour sap. It begins in the extremity of the branches, the leaves crisp up and the stem dies down to the main branch and stops, and then another and another until the whole head of the vine is dead. But, on examining the vine the sap is flowing freely, and has been, yet the main stem dies to the ground. Experiments have been made by budding in the root; they grow well the first year but not the second. It may live to four years, but death is certain. We have sent to gentlemen in France who were experts in vine diseases, and they say they do not understand it. We have a professor in the State University analyzing saps, but his analysis of the sap only shows that the sap is sour and the vine dies. In order to find a remedy we have tried spraying, using different chemicals for that purpose. So you see we have some enemies of the vine there. In the county where I live we have 20,000 acres of vineyard, which produces seventy-five gallons of wine to every man, woman and child in the county; in other words, we produce 2,000,000 gallons of wine. So you see the wine interest is no small thing there.

We have the codling moth there in our apples. The remedy we apply to this is when the apple is formed and turned down we spray with Paris green, or London purple, putting one pound to one hundred and thirty gallons of water, and spray with a pump. Some spray twice and others once. The codling moth goes in the core of the apple, the egg being laid in

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the bloom end, and when it is two-thirds grown it eats out and you see a hole in the apple. But a greater enemy than any I have mentioned is the English sparrow. He is a thief, every inch of him; there is not an honest feather in his head. I have a beautiful plum tree that was white with bloom this spring, an early variety. I went out one morning, and to my astonishment, found these little rascals stripping the bloom. They get so bold that they will even come up where you feed your little chickens and rob them of their food, and if the mother hen remonstrates they will peck her eyes out.

When little plants are growing and are tender they will tear them up. They will assemble in the vineyard when the fruit is ripening and sap the whole vineyard. They will destroy the wheat crop when passing from the milk state into the grain, beating and thrashing out what they don't eat, and when the wheat is stacked they damage it much. You have at present one of the most beautiful State Houses in the country. Wait until these sparrows build on the cornice, and see all this beautiful work spoiled.

Already in Philadelphia, where white marble buildings exist, you can see the pollution they have wrought, and their excretions breeds malaria, typhoid fever and cholera. The English sparrow must go. The physiology of plants is a deep study, the subject increases at every step. I wish to say a word, before closing, about the fig. As I understand it, the fig is a receptacle and not a fruit. The fig begins to grow in the leaves. A little bunch forms between the bark and wood one-half the size of a pin head, and assumes a pear shape. On that little opening you can scarcely get a needle, but all the way down the pollen must be carried from the male to the female to produce seed that will grow. Now you may plant dozens of figs from different parts of the Mediterranean and you may not get but one sprout, because the seed are barren. The Greeks have introduced little insects which go down this little opening for the small drop of honey which it collects there. They maintain that the fig is not good unless the seed would grow. Every seed in a fig is a fruit; nine-tenths of the figs grown in California are barren. To propagate we cut off one-half inch of the old wood, place it in the ground and it will root readily. If you want to raise figs here in the city put down a sprout from a tree that has borne this year, cutting out the central



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bud; cultivate until eight or ten feet from the parent stem, putting a little straw for protection and removing when warm weather comes; in about three years you can have quite a little crop of figs. In England, and in New York and Philadelphia they grow them as I have stated. If I were to make an orchard now I would go to California among the foot hills of the mountains and put out my figs and chestnuts. There seems to be no pest to disturb these fruits. If you go down to the Sandwich Islands you will find that the peach is an evergreen there, but the fruit is not so fine as our cultivated, so we see that culture adds materially to beauty and value.

*W. H. Ragan.* I have been well entertained by Dr. White's remarks. I visited his place in California, and was the guest of Dr. White, who did all in his power to make our visit pleasant and profitable. I therefore move that Dr. White, of California, and Prof. Mann, of Illinois, be made honorary members of this society.

Carried.

On motion of Secretary Hobbs, a vote of thanks was tendered Prof. White for his entertaining and instructive address.

*R. M. Lockhart, of State Board of Agriculture, Waterloo, Ind.* I may not be able to be with you this afternoon, as my business directs me otherwise. I have been much interested in the address and expected to have been here yesterday but was detained on account of a railroad bridge burning. Many of you know that I have been paying some attention to the fruits of Indiana, and while we are glad to know of the great success in California, I want to say with many of you that here in Indiana we need not take a back seat if we know how to handle our orchards. For the last three years I have shown fruit at the State fair. The fruit shown there, except a small amount, was from my county. I am now shipping fruit to this city. I want to say that the question has been asked at our institutes how to raise good fruit, and has been discussed intelligently. During the past fall, while there was much good fruit in some parts of the orchards, the fruit has been injured by codling moth in other parts, and in some places where orchards have been protected the fruit is almost perfect. In our county and Steuben, in the last three months, there has been not less than 3,000 bushels shipped out of these two counties. When you read of the fact that Michigan has good apples, you can count

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on northern Indiana having the same. If the people here would pay sufficient attention to the protection of fruits we need not go to California for them. We have as good fruit as any State in the Union. We have a friend in our town who is a kind of an inventive genius. He makes a kind of gun (exhibits hand-pump, or syringe, with nozzle) to spray his squash and other vines with, as well as trees. I do not think we ever raised nicer squashes than we did this year. The Doctor has stated to you that the time to use this spray is when the bloom is dropping off.

*Dr. White.* In California we have had just such an instrument as this, and all manner of instruments; some of them killed our trees. We want something that will kill the insect and not the tree. A friend of mine said he had expended many thousands of dollars in one year. He sprayed large trees from thirty to thirty-five years old, and forty-feet high; sprinkled them during the spring, summer and winter until he spent $40,000. I spent $600 in an orchard of my own. It is a difficult matter to destroy all the eggs as well as insects. There is always enough left for a new crop.

The codling moth burrows in the ground, and the warm sun hatches them out, and they begin to crawl, and are soon ready to do their work. The codling moth is found over a large extent of country, and does a great amount of damage; to get rid of him we have got to have something that will eat him up, soul and body.

*J. A. Little.* Besides the codling moth there is another trouble, that is the scab. If the apple is perfect and has a worm in it, I can cut around, but if scabby it is worse. What is the cause, and what is the remedy for this? I have fifty Rome Beauty trees; they have a little rust on the leaves and fruit, which has a tendency to dwarf the apple.

*Secretary Hobbs.* In regard to apple scab, the Department at Washington has given attention in the last year or two. It is definitely known that it is a fungus, and they have discovered a remedy perhaps, but it is to be tested more fully. In regard to the disease of the foliage, there is no question but the Department has discovered a remedy for the fungus that affects the apple, pear and plum foliage.

*W. H. Ragan.* I think I can remember; this scab was not known in this country forty years ago. There was a time a cer-

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tain class of apples suffered worse than any others, such as the White Winter Pearmain and Green Bellflower. I have seen Rome Beauty scarcely larger than hulled walnuts, and the next year there would be fine specimens on the same tree. I think we should not destroy trees of Rome Beauty. This rust on the leaves is one form of rust on the Red Cedar.

*Dr. Cornett.* As to my own experience of spraying, I would not advise a person to buy a garden instrument. It is too slow. It will do where you have three or four trees, but where you have a larger orchard it is not advisable. There are hydrant pumps to be found in all the hardware stores, which answer the purpose well. I would advise against buying the patent emulsions that are offered to the public. It is simply throwing away your money.

*E. J. Howland.* I have a pump which cost $6. I put it in a barrel, arranged on the hindermost part of a sled. The barrel holds fifty gallons. The barrel, hose and everything complete cost $8.50. I can throw water over the largest tree I know of. In two hours, with a horse and sled and one hand to work the pump, I can go over two hundred trees, and use about four barrels of water.

*James Sanders.* I used, the past two seasons, a machine which is very convenient for spraying apple trees, and also convenient in spraying potatoes. I drive it with one horse, spraying two rows as fast as the horse walks. In a day's time I can spray a number of acres, and it does the work with less waste of material than anything I have ever seen. But I did not rise to make a speech to the meeting on spraying, but would like to know whether there is any spray as successful as Paris green or London purple. I have tried spraying for two seasons. Last season my apples were poor from the effect of rust. The codling moth were fewer than those who did not spray. I was pretty well satisfied it was a success.

*J. G. Kingsbury.* In speaking of spraying instruments, we have a machine manufactured on South Delaware street in this city. They throw the water high enough, and it works easily and rapidly and costs about ten dollars.

*Dr. White.* Does the spraying entirely rid the tree for one year?

*Answer.* No.

*Dr. White.* Then why spray? If you join with us, and we

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get a parasite that will eat these enemies we will succeed. Let these organizations join in asking Prof. Riley to search the whole world over, and ransack the orchards of the world and find an insect that will destroy the codling moth. The English sparrow don't eat any pernicious insect, but feeds principally on grain. England is amazed at America that she will import the most troublesome bird we have.

A telegram was received from the Missouri Horticultural Society conveying cordial greetings to the Indiana Society. The Secretary was instructed to prepare and forward a response.

Adjourned until 1:30 P. M.

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## Afternoon Session.

### DISCUSSION.

*J. A. Burton.* We want to recommend a list of fruits for premiums for general display at the State Fair. There are not enough varieties named in the present list.

*W. H. Ragan.* I was not present during your talk, and do not know what was recommended, but I understand you are in favor of confining the display to a certain number of varieties. The collection of fruits are exhibited largely for the general effect. There should be a premium on general collections of fruit. One object of the fairs is to make the exhibits as attractive as possible, to bring visitors to see them and to get what educational advantage they offer. There should be a definite number of specimens on each plate. A dozen specimens for plate premiums would be better; it makes a better show than in baskets. I noticed this at Detroit this fall; they had them exhibited in baskets; they even carried this down to peaches and plums. It made a large show, but the baskets are not attractive. A dozen good specimens would have been more attractive, as far as beauty is concerned, and far less expense and trouble to provide for them.

*J. C. Ratliff.* The proposition of having fruits of a kind grouped together strikes me favorably. If there is anything that is unsatisfactory it is running around to different tables to hunt the different plates of fruit. It is troublesome and takes

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much time. If all of one variety were put together it would facilitate matters. We should limit the number of varieties competing for premiums, and should have such varieties placed so we can see who has got the premium without having to look over so much space. We want to get the varieties grouped close together. Where counties make exhibits, let each county have a particular place where it can exhibit its fruit to the best advantage as it sees fit. Let the committee take this into consideration, and let this Society indorse the committee and recommend this to the State Board of Agriculture.

*Secretary Hobbs.* I would suggest that this committee that has been appointed report to the summer meeting, and the Society then can accept or reject, and then it can mature something in time for the State Fair.

*E. J. Howland.* I can not endorse the recommendation of the President yesterday in regard to Vandevere Pippin and Rhode Island Greening, two apples you could not give me to set out on my soil. On my soil they are the least productive of any varieties I have any knowledge of. In this respect it would cut me out. You might offer a premium for thirty or forty varieties, but not otherwise.

*Mr. Burton.* I mean to offer a premium on individual apples, but you have your's down along with mine and Mr. Ragan's and others.

*Mr. Howland.* I am not speaking of individual variety, but general display. You can not make a display without a general variety. It don't make any difference from one variety to one hundred varieties.

*W. H. Ragan.* We have been keeping two separate premiums for amateur and professional fruit growers. General premiums should be given, and smaller ones; but the majority offered on individual varieties, a dozen apples of given varieties, and make no distinction as to amateur or professional.

*Isham Sedgwick, Richmond.* We want to economize room to show the greatest amount of fruit by having all the specimens of one variety alongside with each other so the committee can compare them. I am somewhat opposed to this plan of awarding the premium on account of the vast number shown, because quality is hardly considered. The merits of each kind should be defined; then if you want to make a premium for the largest number of varieties, make one for that. You might pick out

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a large number that would be creditable and profitable to grow and the others would not, while an exhibitor might come in with a small number, but valuable in kind and quality, and not be able to show at all. I think it would be impossible to give a definite plan now, but perhaps we can later in the meeting.

*Mr. Ragan.* I think we should take some action on this matter and report it to the Agricultural Board.meeting in February, which is the time they make up their premium list, and I think they will do something for us.

On motion of Sylvester Johnson, the Society went into the election of officers, which resulted as follows:

President—Joseph C. Ratliff, Richmond.

Secretary—C. M. Hobbs, Bridgeport.

Treasurer—Daniel Cox, Cartersburg.

Vice-Presidents—First District, J. A. Burton, Mitchell, First Vice-President; Second District, Dr. Charles C. Cornett, Madison; Third District, W. A. Workman, Greencastle; Fourth District, J. C. Stevens, Centerville; Fifth District, G. W. Grant; Sixth District, I. D. G. Nelson, Ft. Wayne.

Executive Committee—J. J. W. Billingsly, Indianapolis; L. B. Custer, Logansport; Prof. J. Troop, Lafayette.

Mr. Ratliff, the newly-elected President, on being conducted to the chair, said:

*Gentlemen of the Indiana Horticultural Society:*

This was unexpected to me. I know of no reason why you should select me. I served in this capacity from 1872 to 1875, when the Society was scarce of material. I will do the best I can. It was the least of my expectation. I did not have any desire to serve as President of this Society. Again I feel my incompetency, following, as I do, such illustrious predecessors. Sylvester Johnson was President for a number of years, followed by Dr. Furnas, one of the fathers of the society, a man always ready to give valuable aid and information and advance the interests of the Society to the best of his ability. I thank you for this token of honor, and appreciate it fully, and will surely do the best I can for the best interests of the Society.

On motion of Mr. Frost, the Secretary was instructed to write and forward a letter of sympathy to Vice-President J. C. Stevens, a member of this Society, who is at home very sick.

Prof. Troop, expert fruit judge, submitted the following report, which was accepted:

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## REPORT OF COMMITTEE ON FRUIT DISPLAY.

Your committee appointed on fruit display begs leave to submit the following report:

| | |
|---|---|
| Premiums Awarded for Best Collection of Fruits— | |
| Switzerland County, first | $6 00 |
| Lawrence County, second | 4 00 |
| Best Plate Grimes' Golden— | |
| W. A. Workman, Greencastle, first | 50 |
| Best Plate Rome Beauty— | |
| J. Beard, New Albany, first | 50 |
| Best Plate Ben Davis— | |
| J. Beard, New Albany, first | 50 |
| B. H. Carter, Clayton, second | 25 |
| Best Plate Tulpehocken— | |
| B. H. Carter, Clayton, first | 50 |
| Best Plate Winesap— | |
| J. Beard, New Albany, first | 50 |
| J. A. Burton, Mitchell, second | 25 |
| Best Plate Willow Twig— | |
| Mrs. Flick, Indianapolis, first | 50 |
| Best Plate Yellow Bellflower— | |
| Mrs. Flick, Indianapolis, first | 50 |
| Best Plate Baldwin— | |
| J. Beard, New Albany, first | 50 |
| Best Plate White Pippin— | |
| J. A. Burton, Mitchell, first | 50 |
| Mrs. Flick, Indianapolis, second | 25 |
| Best Plate Stark— | |
| E. A. Eickhoff, Indianapolis, first | 50 |
| Best Plate Rambo— | |
| J. A. Burton, Mitchell, first | 50 |
| Mrs. Flick, Indianapolis, second | 25 |
| Best Plate Crabs— | |
| J. A. Burton, Mitchell, first | 50 |
| J. Beard, New Albany, second | 25 |
| Best Plate Pears— | |
| E. A. Eickhoff, Indianapolis, first | 50 |
| Lee Walker, Greenfield, second | 25 |
| Best Plate Quinces (Mo. Mammoth)— | |
| William Mustard, Indianapolis, first | 50 |
| J. Beard, New Albany, second | 25 |
| Best Display of Vegetables— | |
| E. A. Eickhoff, Indianapolis, first | 6 00 |
| Display of Plants and Flowers— | |
| Bertermann Bros, Indianapolis, first | 8 00 |
| Mrs. E. A. Eickhoff, Indianapolis, second | 5 00 |

Besides those already mentioned we find on exhibition, from Floyd County, twenty-five varieties of apples.

E. A. Eickhoff, Indianapolis, fifteen varieties of apple, one variety of pear.

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B. H. Carter, Clayton, three varieties of apple.
Mrs. Flick, Indianapolis, seventeen varieties of apple.
W. A. Workman, Greencastle, eight varieties of apple.
F. M. Butterfield, Lee's Summit, Mo., two plates Gano apple.
S. H. Frazier, Danville, twelve varieties of apple.
J. H. Beard, New Albany, four varieties of apple.
R. M. Lockhart, Waterloo, four varieties of apple.
Sylvester Johnson, Irvington, three varieties of apple.
Adison Coffin, Hadley, five varieties of apple from Nevada.
D. E. Hoffman, Winchester, one variety of pear.
Hancock County specimen of seedling pear.
B. F. Stinger, Charlottsville, two cans of strawberries in alcohol.
A mammoth specimen of turnip from J. Beard, New Albany.

We also find a beautiful boquet of hybrid tea roses from Hill & Co., Richmond.

Also, one chrysanthemum from Bertermann Bros., Indianapolis, and the one you see before you from Mrs. Danley, of this city.

Perhaps the most interesting collection of all is that sent us from California by our ex-president, Dr. Allen Furnas. It consists of five varieties of oranges, two varieties of lemons, two varieties of citrons, two plates of limes, three varieties of pear, four varieties of apple, one variety of quince, three plates of Japan persimmons and a miscellaneous collection of hard and soft shelled English walnuts, olives, dates, figs, banana bud, mammoth pine cone, cotton, and last but not least, three specimens of sweet potatoes, the largest one weighing 16½ pounds.

Respectfully submitted,

J. Troop,
*Committee.*

*L. B. Custer, Logansport.* There was a committee appointed a year ago to report something in regard to the condition of the State Library. I think perhaps the report is due at this time.

*Mr. J. P. Dunn, State Librarian.* The Horticultural Society appointed Dr. Furnas to act with other societies to secure legislation by which the library might be increased so that agricultural works might be furnished for the benefit of the public, and especially the agricultural classes. The appropriation was increased to $5,000 for this year, and $2,000 afterwards; heretofore it has been $4,000. The Board would be glad to receive any suggestion from the Society, or a list of books that would be useful to you on horticulture.

*J. C. Ratliff.* This should interest all. We have a subject here which is right in line with our work. As we have an opportunity now to recommend certain books for that library it would be right for a committee to have this under consideration and report the number and kind of horticultural books we want for the State Library.

*J. G. Kingsbury.* I move that a committee be appointed to make a selection of books for placing in the State Library.

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The motion carried, and J. G. Kingsbury, J. A. Burton and Franklin Taylor were appointed said committee.

*Secretary Hobbs.* There is a constant demand from all over the State for lists of varieties of fruits adapted to the different soils and situations of the State. I can think of no plan so practicable and satisfactory for securing such a list as to send blanks to four or five of the leading fruit growers in each county in the State and ask them to give the names of only such varieties as have proven profitable and desirable in their locality.

*W. H. Ragan.* This is working in the right direction for making out a fruit list. We have had the Star List, which was not reliable and was unsatisfactory. Some years ago I sent out inquiries over the State for a recommended list of apples. I received a number of replies. I published the answers in a summary which will be found in the volume of 1874. The plan proposed is more comprehensive than that one, which only applied to apples. The list should be gotten up showing a definite number of varieties of fall, summer and winter. If you allow one man to make out one number and another a different number, it is difficult to harmonize when you bring them together. The only way is to send out these forms so the report can be made easily. When this blank is sent out, the person receiving them can study the matter over and make a deliberate, careful report; they will be very unlike the American Pomological Reports, which are made up hastily, and are unsatisfactory.

*J. G. Kingsbury.* I move that this question submitted by the Secretary be referred to the executive committee for them to act upon and report to the Society at the summer meeting.

*Secretary Hobbs.* If it could be acted on now, the blanks could be gotten out at once and the lists ready for the forthcoming report.

*J. J. W. Billingsly.* As I am a member of the executive committee I would like to know what the duty of the committee is. Are they to pass on the feasibility of this list? Let the Secretary send these out in connection with the executive committee.

*Mr. Ragan.* I do not see anything to hinder this. I think the Secretary should be authorized to attend to this, as it is difficult to get anything out of a committee when so scattered.

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*Mr. Kingsbury.* I will withdraw my motion and make another. I now move to adopt the suggestion of the Secretary and instruct him to issue the blanks. (Carried.)

*Prof. Troop.* I think this Society should be a member of the American Horticultural Society in order to get reports of that society to put in our library. I, therefore, move that this Society become a member of the American Horticultural Society.

*Mr. Ragan.* A great many State societies are members of the American Society. It is desirable to have a complete set of reports and they may be obtained in this way.

*J. C. Ratliff.* If it is customary for one society to become a member of another, there is nothing wrong in this movement for the Indiana Society to become a member of the American Society.

*Prof. Troop.* It is on the same plan as the local societies becoming members of this Society. (Motion carried.)

*W. H. Ragan.* As to the character of our last report, it is the first instance of its going into the Agricultural Report. I had been doubtful about the propriety but finally yielded. I have no objection to them publishing our report, giving additional circulation, but there is objection that it comes out as it has. Only two hundred copies bound for us; all others buried in the Report of Agriculture. More than all, it is printed on poor paper, all alike, in the same kind of type, has no heading and no introduction. It was what I feared from this publication. I think we are entitled to better appearance than the last volume and entitled to more than two hundred copies, as they scarcely supply our members. We should have them in our libraries, as they are frequently called for. The Missouri State report came out recently with 3,000 volumes. No State has a volume less creditable than we have. If we can't get it printed in better style we should print it ourselves. I know how they will be received by other States. I make this criticism in a most friendly manner, as I simply wish to call attention to this matter.

"My Experience With Plums," was the subject of a paper by W. H. Lafuze, Liberty, Ind., which was read by Secretary Hobbs.

## MY EXPERIENCE WITH PLUMS.

There is no fruit with which I am acquainted that is more highly prized or eagerly sought after than this delicious and wholesome fruit; yet there are very few persons who have succeeded in growing a supply even for home use. But I

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think the time has come when the possibility of an abundant supply of this healthful fruit is beginning to be realized by many who had lost all hope of ever being able to successfully grow them. The most common mistake has been in planting a few isolated trees and these perhaps of varieties that do not produce perfect blossoms.

I have often observed that apple, cherry and other fruit trees that stood alone in fields or pastures did not set fruit in some seasons like those that stood in groups or in orchards. My first experience in plum culture was about fifteen years ago, when I bought four trees, at an exorbitant price, of the Wild Goose variety. One of these trees ripened about sixty nice plums the fourth year after planting, which was somewhat encouraging, but after waiting nine years longer only to see them white with bloom every spring, but failing to get a dozen plums in all these years, I concluded there must be something wrong with the blossoms. In the meanwhile a Miner plum tree had been planted near one of these trees, and the first year this tree had blooms the Wild Goose ripened quite a good many nice plums on the side next to this tree. The next year that side of the tree was quite full, and a few scattering ones on the balance of the tree, and each year since, the entire tree has been loaded with plums. Of course the Miner tree grew and continued to bloom every year, but from some cause it has failed to set only a few scattering plums.

In the spring of 1885 I ordered from the nursery of Albertson & Hobbs, of Bridgeport, trees of the Robinson, Mariana, Lombard, Mossback, Shropshire, Damson, German Prune, Early Red, Golden Beauty, and a few other varieties, thinking I would try plum culture on a little larger scale. I remember that my wife remarked at the time that she guessed I was going "plum crazy." Well, anyhow I felt pretty confident of raising some plums, and I did, too, and much sooner and more successfully than I had anticipated, for the third year after planting, every limb of some of the trees had to be propped to keep them from breaking under their load of fruit. Last year they were even fuller than the year before, if that were possible. Lombard, Mariana and German Prune did not bear much until the fourth year. On one small limb of the Lombard, about fifteen inches in length, forty-eight plums were counted when ripe.

No doubt the plum would succeed on any soil rich enough to produce a crop of corn or wheat, but I think a deep, rich soil is best, and a lot where poultry can be kept is undoubtedly the place to plant plum trees. They should be planted twelve or fifteen feet apart and cultivated and mulched well for two years at least. Some varieties require considerable pruning to keep them from heading too low and from getting too thick.

My experience with black knot is quite limited, but I should cut out all infected branches as soon as discovered and burn them. The little insect called the curculio seems to be the most formidable enemy with which we have to contend. They are about a quarter of an inch in length, of a dark brown color, and when running they somewhat resemble a full grown hog louse. It is wonderful how rapidly they can move about, and just as wonderful how they can "play possum" and pretend to be nothing but a piece of bark when you want to capture them. A great many people firmly believe that they do not fly, but climb up the body of the tree. Now, this may be true in part, but when full grown they can fly readily. Some think they have sometimes saved their plums by tying a bunch of wool around the body of the tree a foot or two from the ground, thus preventing them from climbing the tree. The above remedy may prevent them from getting at the plums as early as they otherwise would, and should a rain set in just at the right time and continue for a few days some of the plums might escape. But in my own experience I have found the jarring process the only successful practical remedy. I bought four yards of cheap muslin and cut it into two pieces of equal length and

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sewed them together half way, leaving the other half to go astride the trunk of the trees. Nail the outer edges of the muslin onto two light strips of wood two yards in length. The strips serve to keep the cloth spread and to handle it by. After a little practice any one can place the cloth in position around each tree in an instant.

Then by jarring the tree the insects will fall on the cloth, where they can be seen readily and caught and destroyed. Small trees can be jarred by striking with the hand, but large ones should have limbs sawed off to strike on with a heavy mallet or hammer.

The work of jarring need not begin until the plums are of considerable size, or not until the curculios make their presence known by the crescent-shaped mark on some of the plums; but it is very important that this work be begun before many of them have been stung. It is claimed by some authorities that a single curculio will on a fair day sting about forty plums. If this be true, how long would it take twenty or thirty of them to sting all the plums there are on a tree? They show a great deal of wisdom in the manner of doing their work. Early in the season they sting the plums near the lower end, but later they will sting them up near the stem, in order, I suppose to make them drop off sooner.

There is another way of protecting on a small scale, which I have tried successfully on small trees just coming into bearing, when I desired to test my new varieties. Take small sacks made of cheese cloth, or cheap muslin, and tie them over some of the plums, and they will grow and ripen nicely. In the morning is rather the best time to catch the curculios, but it can be done successfully any time of day. The Chickasaw variety of plums is not as subject to their attacks as are the finer varieties, especially those of foreign origin. So far, in my experience, the Golden Beauty has been entirely free from their attacks. Although rather late, I consider this a valuable variety for pie or dessert. They will keep four or five weeks after taken from the tree. Mariana has not been injured by the curculio, and I think is the best in quality of this class of plums that I have in bearing.

A small tree of the Mossback which is hardly seven feet to the topmost branches, bore last year and year before, over one-half bushel of plums each year. The fruit is not of first-class quality. Early Red ripens about the Fourth of July, is free from the curculio, and is of good size and quality for so early a plum. The Prunus Simoni, or Apricot plum is the most beautiful fruit that I have ever seen. A small tree planted in the spring of 1886, ripened eight plums in the summer of 1888. The largest one was three inches broad and one and a half inches thick. When ripe they were of a real dark red color, and smooth as any tomato. To eat raw they seemed rather tough, cooked they were delicious. The fruit when ripe is very highly perfumed. I think it is doubtful whether this fruit can be grown successfully in this climate.

Now a few words in regard to varieties. Out of the thirteen varieties that I have fruited, I would select for the best five, Lombard, German Prune, Shropshire, Damson, Mariana and Robinson. Wolf, Pond's Seedling and Imperial Gage are varieties of much promise. In fact there is no end to the list of good plums. Now, in conclusion, I want to say that if I have, in my humble way, said anything that will benefit or encourage any one in the cultivation of this desirable fruit, I shall feel well rewarded for my labor in preparing this paper.

W. H. LAFUSE.

Liberty, Ind.

DISCUSSION.

*J. C. Ratliff.* Those of you who visited our summer meeting at Richmond recollect, perhaps, the number of European plum

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trees I planted out and how full they were. I planted out about fifty trees, were five or six years old, and never bore until that season. That season we had to put props under the limbs to prevent them breaking down. About the time they commenced coloring, there commenced a kind of a rot or fungus, attacking them on the side that began coloring, and kept on until it surrounded the plum, and the next plum touching was affected immediately. We lost many of our plums in that way. This was true of every variety I had growing. I made up my mind that I could fight the curculio and beat him, but this rotting has taken the ardor out of me. I have talked with people from different parts of the State, and find that plums don't rot throughout the State. I have not entirely given up the idea of raising plums, but I did grub up the Wild Goose and destroy it; not a plum would ripen for me of that variety.

*Prof. Troop.* As to the plum rot, I have not had experience with it, but last summer, when at Columbus, Ohio, their plum trees were full, and the entomologist was experimenting with the Bordaux mixture. The year before their plums rotted, so they sprayed with this mixture and did not have any rot on them. Those that were not sprayed rotted. As to plum curculio, spraying with Paris green or London purple works well.

*James Sanders.* I had some trouble with plum rot on my Lombards, but German prunes were loaded and not affected with rot; Wild Goose were loaded, and some laying on the ground. Robinson were also heavily loaded, and had a good crop of Miners. I had some Shropshire Damson. Some report this variety too tender for this climate, but mine seem to bear. I have also a plum which ripened in October. I do not know what kind. It keeps well; a seedling sent to me from Iowa with Miner's seedling.

*Mr. Ratliff.* Were those plums near those that did rot?

*Mr. Sanders.* My German prunes were near the house. The Lombards were in the bottom, while the others were some eight or ten rods from the others. As to curculio, we did not need protection from this on the Chickasaw. There is an advantage on the Chickasaw and Robinson, as they seem to overbear with me.

*Mr. Little.* What is the quality of the Prunus Simoni?

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*C. M. Hobbs.* The Prunus Simoni is a native of Japan. It has not the astringency of our native plums. It is a large plum and cooks well.

*Mr. Little.* I have the Miner. It has a thick skin for a plum, and for quality is between the Wild Goose and Robinson.

*W. A. Workman.* I have the Robinson, Golden Beauty, Miner and Wild Goose. I have not as yet found any necessity for catching the curculio; the chickens do this. They bear quite full, but I am troubled sometimes with the rot.

*Mr. Little.* I wish to call attention to the Lansingburg apple. It is the best long-keeper we have without exception. I have an apple now of that variety which grew in 1888 perfectly sound. I intended to have brought it here with me but forgot it. I never expect to be without ripe apples again; tree hardy, good bearer and bears young.

*Mr. Workman.* The Lansingburg is a good grower and at best very sightly in appearance.

*Secretary Hobbs.* This apple has come to us the past two or three years to be identified oftener than any other variety.

*Mr. Glenn.* I move that one hour be devoted to discussion of the fruits in the exhibition room.

*Mr. Ragan.* I do not think it would hardly be advisable, as there are other topics which must be taken care of to-night.

*Mr. Glenn.* I insist that we have this discussion, as there are varieties on the tables we want to know something about. (Motion carried.)

*Mr. Sedgwick.* While the subject of "insectides" is before the meeting I will suggest this: There are a great many people who won't take the trouble to fix up insectides and use them. I think the idea would be a good one if we would encourage people to engage in the business of manufacturing insectides and spraying trees. Let them go to a man and spray his trees for so much and make it a business.

On motion of Mr. Burton, the Secretary was instructed to prepare a list of the most approved insecticides and publish them in the forthcoming report.

*Mr. Sanders.* I suggest the proper amount be also given. We are liable to put on too much.

*Mr. Ketchum.* I wish to know something about heeling in trees, whether a southern or northern exposure is preferable.

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*Mr. Workman.* I have tried this successfully, heeling in slanting, with tops to the south, so if the ground freezes the roots will continue frozen. I put them at an angle of forty-five degrees. Suppose I heel in 1,000 trees, I make my trench four feet wide and make a wall of dirt two feet high, setting the trees in and throwing the dirt well around the roots. We sometimes have weather that trees can not be moved and heeled in later than October. I have moved and heeled in in September. In the spring they were as good as trees dug and heeled in later, if not better. They had thrown out many fine roots and were in fine condition. Sometimes we disagree about the time for planting trees, but when we plant trees in the spring we should dig in the fall.

*James Sanders.* I have had some experience in heeling trees. I heel in any kind of manner, so the roots are covered up. I throw out a trench first, then take the trees and set them upright and throw in dirt. In regard to spring or fall planting, I will say I do not know why a person would buy a bill of trees and heel in and plant in the spring. Why not plant in the fall and let the dirt settle around the roots, letting them grow in the spring without disturbing them? If I dig in the fall I plant, but I would rather have a tree dug in the fall and plant in the spring than to dig in the spring. Trees dug in the fall, the roots will callous and get in shape to throw out roots early in the spring.

*D. E. Hoffman, Winchester.* Will a tree dug in the fall stand as low temperature as one dug in the spring?

*Mr. Sanders.* Yes, I think it will if the weather continues warm right up to the time winter sets in. If the tree is full of sap we get our damage by freezing. This was the case a few years ago. Trees when full of sap, it will sour and they are liable to be killed. A tree as a rule will stand better dug in the fall than left standing in the nursery.

*Mr. Little.* If I were going to plant an orchard, and could not plant this fall, if there come a thaw in January I would plant then.

*Mr. Workman.* I will give a reason for digging in the fall, even if not planted. We have had them killed down to the snow line, but if covered up to the limbs that would protect them. As Mr. Sanders says, the roots must have some time to callous; if this is done through the winter they are ready to grow in the spring.

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*W. H. Ragan.* This is an important question. I have long ago decided that the fall is the best time to plant deciduous trees. I would plant in the fall always, yet there are certain classes to be considered. Otherwise, on general terms, if they are properly planted in the fall it is certainly better than in the spring. The great difficulty in the spring is that we defer too late. As soon as the leaves develop there is a draught on the resources of the tree; interrupt that and stop all work that has been accomplished, you have the conditions you do not want. The theory of propagating by cuttings is to have them where you can control the conditions. Keep the ground warm and the atmosphere cool to retard growth above ground, and farm the root in the warm soil and hold back bud development until it can be supported by the roots. You have the warm soil of fall, and in the spring the atmosphere is cool. The trouble is that the tree is more susceptible to winter damage after planting than before. You can plant in the fall, and if it is not a cold winter they are all right. Put out early, build a mound of clean earth around them to hold the tree in place, instead of a stick. Put the roots at a proper depth, and in the spring level this mound down, and unless a cold winter you will have better results.

*Mr. Workman.* Mr. Ragan knows more about the nursery business than I do. But is there any probable danger of trees being killed set in the fall? This argument is used in the northwest, particularly in Iowa, but in our latitude I would ask if it is not safe to plant in the fall?

*Mr. Ragan.* These extremely cold winters do not often occur here. Probably in 1864, when it was so very cold, trees might be killed here. We don't know what kind of winter we are going to have when we tell our customers to plant.

*Mr. Sanders.* In regard to winter killing, my statement was correct. The kind of winter we had in 1881 the trees were full of sap and froze in that condition. Trees dug that fall went through better than those not dug. In the north where trees are frozen a great length of time they are killed by drying up, or the evaporation of moisture.

*Mr. Hobbs.* I think Mr. Sanders is entirely correct.

*Mr. Ross.* I would ask what proportion would be right in cutting back a tree just planted.

*Mr. Ragan.* This question might be discussed. I think there



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can be no doubt a portion of the top should be removed in most cases. You must cut back in proportion to the root, probably it would be safe to say one-third of last growth and possibly one-half.

*Mr. Hobbs.* This cutting back should be in the spring.

On motion of Mr. Leitzman, the California fruit on exhibition was ordered disposed of to the highest bidder.

W. H. Ragan was appointed delegate to the Illinois horticultural meeting.

On motion of Mr. Sedgwick, Miss Belle Ragan was appointed delegate to the American horticultural meeting to be held in Austin, Texas, in February next, and an appropriation of $10 to defray her expenses.

On motion of Mr. Ragan, President J. C. Ratliff was appointed delegate to the Ohio horticultural meeting, to occur next week.

Society adjourned to 7 o'clock P. M.

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**Wednesday Evening Session.**

President Ratliff called the meeting to order at 7 o'clock. The audience immediately repaired to the exhibition room, where an informal discussion was, for a short time, participated in on the fruits on exhibition. During the discussion Mr. Detraz presented a large seedling apple. After testing its quality it was deemed worthy of a name, and was christened "Switzerland," in honor of the county in which it originated. Mr. Denny, of Marion county, also described a seedling summer apple, which was considered worthy, and was named "Sewall."

Owing to the general and conversational character of the discussions, the reporter was unable to make a satisfactory report, hence the discussions on the fruit exhibit do not appear in the transactions.

At the close of the discussion on the fruit exhibit, the Society returned to the lecture room and resumed regular business.

*W. H. Ragan.* I have just learned that John Wright, a charter member of this Society, of Vevay, has recently deceased. I

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move that we express our loss and regrets at his death and express our sympathy with his family, and the same be placed on the records.

It was so ordered.

Isham Sedgwick read the following paper on "My Experience With Grapes."

## MY EXPERIENCE WITH GRAPES.

The invitation for this paper read, "Experience with Grapes," and further it said, "My Experience," I am therefore barred from quoting from others. I will therefore, also be denied the privilege of discussing the theory or practice of anyone else. I am glad of this, for I am saved the bother of reading up on the subject. Nothing is expected of me except the knowledge gained from my personal acquaintance with this, to me, favorite fruit. I say to me favorite fruit in good earnest. Away back in my boyhood days, I knew two cultivated grapevines. One was an Isabella that grew along the house and out on a trellis at the home of my Uncle William Byars. This generally bore a bountiful lot of grapes, but as it was the only one in the neighborhood known to me, an occasional bunch, probably three or four a year, was a luxury that went to a boy's mouth with a relish that is a relish in memory now. This was about the year 1852. I remember but litttle of the cultivation of this vine except that it was allowed to run almost at will, the only effort at training being to provide on the trellis sufficient room for the vine. About the year 1855 an addition was built to the house, and the vine was moved to the garden, but failed to grow. The other old vine of my earliest recollection was a purple grape brought from the northern part of the State to the home of Wilson Hunt, in the south part of Wayne County. It was called the Lake grape. The berry is about the size of the Clinton, but the bunch is scattering like the wild grape. It was foxy in flavor, quite sour, heavy fleshed, and the seeds parted readily from the flesh. The juice would make a good ink, it had such a capacity to stain. Still after frost it was quite good to eat and was good for pies and jelly. It had the merit of being perfectly hardy and free from any disease. This vine was given possession of an apple tree, and eventually downed two or three trees. When I last saw this vine it was about four inches in diameter, and would bear many bushels of grapes every year. This variety will not bear pruning, but if given a tree it will take care of itself and fully reward the planter. You may safely calculate that it will go to the top of any tree if it can get a hold so as to climb. In ten or twelve years it will cover almost any tree. There is one on a thirty-inch sugar tree at my father's old place, and it is loaded with fruit nearly every year, and has almost smothered the tree. I think this vine is now about twenty-eight years old, and the original vine, it still growing, must be quite fifty years old.

About the year 1860, my father planted out a dozen Catawbas, and these were trained to stakes. I was the boy to attend these, and then I began to study the subject. These were set on the northern slope of a hill in stiff, reddish clay soil. During the first five or six years these vines gave some fine bunches of excellent flavor, except in 1864, when they were killed to the ground. In the summer of 1863 we set a lot of vines on the top of the hill in light clay soil. These were Clinton, Isabella and Catawba. We dug a deep trench about two feet wide, and put a lot of stable manure in the bottom, then filled with the top soil and set our vines in two rows about eight feet apart, and about ten feet apart in the rows. Here we

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began the practice of cutting back to three buds in the early spring. We were reading the American Agriculturist at that time, and boylike, I believed everything that I saw in the paper, and when I read that cutting back the ends of the vine and thinning the leaves so the sun could shine on the fruit, it would ripen better, I began the practice at once. It was not until the next year that I learned that by cutting the vines and leaves back in the summer that I had stunted the vine, and the fruit was smaller and inferior. In 1866, 1867 and 1868 I was away at school most of the time, and was only home in the early spring when I trimmed the vines, and again when the fruit began to ripen. We had a great deal of fine fruit on this arbor until 1869, when the rot struck the Isabellas and the scab attacked the Catawbas. The Clintons were very fine here. All this time I stuck close to the idea of cutting back to three buds in February or early in March, but I abandoned the summer pruning in the way of taking off the leaves and pinching back.

In the spring of '71 I moved to my own farm in Randolph County. Here I had a rich, sandy loam for my garden, and I set Delaware, Eumelan, Concord, Clinton and Lake. I did not try the Catawba here for the reason that I had lost faith in it. This place was two or three hundred feet higher ground, and it was colder and the seasons shorter than at father's. Frosts came later in the spring and earlier in the autumn. I wanted earlier kinds. My success was varied here. The Lake grape I put on a trellis, and as I had to prune it or trellis more every year I got no fruit on this variety. The Clinton also put in near all its time making vine. The Concord did nearly the same, and the Delaware was often winter-killed. I gave the Eumelan the south side of a building and very carefully trained and pruned it, and it rewarded my labor nicely. The Eumelan did very well for eight years, and then died, apparently at the root first. I still followed the idea of cutting back to three buds in the spring, but let the vines grow freely in the summer. Some of the Concords are still bearing, but as they are not so well cared for nor carefully pruned there is not much really good fruit produced.

For the last six years I have given the grape much of my leisure time, and have stolen a few hours from the office to devote to my pets. I have made the vine a special study, and I am now astonished to find how little I knew about how to manage the vine. My regret now is that I have not more time to give to the study and to work with my vines. Yet the Wayne County Horticultural Society, and several members of the State Society, will attest that I have met with fine success. I now find there is a field for reason, and the exercise of one's best judgment, in handling vines, that I never dreamed of in the days when I had better opportunity of showing what could be done with the vine than I now have.

To begin with this last experience, I am on the highest ground in the city of Richmond. The top soil was light clay, and under this a stiff, red clay with a good many limestone pebbles in it. The hill was graded off about four feet, and the part taken off tapered out to nothing. Nearly all the vines are in the subsoil. Where the vines are there was from one to four feet of the top soil removed. I dug holes, removing about two-thirds of a cubic yard of the clay and filling in with the surface soil. I have relied on a mulching of stable manure to keep the requisite fertility in the soil.

Here I have planted the following varieties that have fruited: Hartford, Martha, Concord, Perkins' Worden, Lady Washington, Faith, Niagara, Moore's Early, Empire State, Naomi, Delaware, Early Victor, Pocklington, Centennial, Duchess and Francis B Hayes. And have also set the following, that have not yet fruited: Brighton, Moore's White Diamond, Moyer, Witt, August Giant and Woodruff Red.

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For the benefit of those not thoroughly familiar with the ones I have fruited, I will tell you about them as they do under the conditions I have described. My trellis of pipe and wire netting is the admiration of all that see it, but it has not the least protection against the winter, and the vines have none of them been in the least protected from the cold. They have received no cultivation except the mulch put around them in the winter.

I will place the Niagara first. And if you saw the rich growth of vine and the great bunches of golden berries and tasted the richness of them, I am sure that you would agree with me that it is the one that possesses the most points of merit. There is one point in eating them that is a surprise to me, and that is they are too rich to eat as many of them as would be eaten of some other varieties. When ripe they make a red jelly. The appearance on vine and also on the plate is very fine. The vine is healthy, and there is very little rot and almost no mildew. It bears full enough.

Delaware should have the second place. Last year my four-year-old vine showed 241 bunches, and they were all nice, yet there were some of the bunches that did not fully ripen. I was too covetous and wanted to get too much fruit, and let it overbear. This year I thinned it to 140 bunches, had finer fruit and it all ripened, and there is much better wood for next year's service. If the Delaware was a better grower it would take the first rank. All agree that this is the first in its pure flavor and delicate appearance. I will tell you of the exception later.

Because of its earliness and clean fruit and superb health of vine and leaf, I place the Early Victor third. This is a rich purple grape with very compact bunches of good size. It is good eating as early as August 10 with me. There was not the slightest speck on a single berry of this vine in the four years of its bearing. I like it better than the Concord, and it will bear an equal weight of fruit and the vine is about equal in growth.

Faith, I have placed fourth, and I hardly know whether I have done this vine justice or not. It is a rampant grower. The strongest of any that I have. It is a great bearer. The vine, four years old, gave me 560 bunches. The berry is about the size of the Delaware, but there are not so many in the bunch. The bunch is loose, and is very tenacious in hanging on. Mr. Thos. Morris and I ate grapes off this vine on the 5th of March, 1889, and they had hung on the vine ripe since August, '88. The fruit is sweet and delicate; almost equal to a Delaware. Its fault is that it is early in blossoming, and is often killed by the frost.

Fifth, I place Perkins. It grows a little better than Concord, ripens earlier and is the best jelly grape that grows. It is good for use from August 15 to frost. The jelly is very fair and of excellent grape flavor, and never shows the least indication of graining, but stays as smooth as the finest apple jelly.

Sixth, I will place the Concord, and there is no need of saying anything about this well known variety.

Seventh is Martha, and I like it really better than the Concord, but it has not fruited quite as freely. It is the most delicate in the skin of any that I have.

Duchess is a much better grower than the Concord, and better in quality. The taste is fine, and it has solid meat like the California Tokay. It is the worst troubled with rot of any that I have. Were it not for that I should place it not lower than fourth in the list. The bunches, when perfect, are the finest of any. The skin is very delicate, and yet it will be good from August 25 till after hard freezing. I have placed this eighth, and yet I doubt whether I have given it full justice.

Ninth, I will name the Francis B. Hays. This vine started slow, but is now

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growing better than the Concord. It has only fruited the last two years. In berry and bunch it is nearly as fine as the Niagara. A little better eating. It is so far entirely free from rot or any disease. I should certainly give this a much more prominent place if it had given me more fruit. It has not borne more than one-eighth as much as Niagara. This year it bloomed a little too early, and the frost killed the fruit. I hope to report better on this next year. The vine is in very fine condition now.

Tenth, I must put that good old Hartford. It has done well every year. Not as good eating as most of the others, but it grows well and gives lots of fruit. Its trouble of dropping the berries when disturbed in gathering is against it. This year has been an exception on this point, and there are berries yet hanging on this vine.

I will not number the following, but simply tell how they have done. Lady Washington has produced a fair quantity of the very finest bunches that I have raised. They do not all ripen well and there is so little change in the color that it is not easy to tell which are fully ripe until the berries are in the mouth, and then you are often regaled with such an acid that you forget the very sweet and delicious berries that were fully ripe. This vine kills back too much in winter to give really good bearing wood every year.

The Pocklington, as it grows with me, is a delicious grape, and its large, golden berries are delightful to the eye and palate. It is healthy and clean, but it is too slow a grower.

I find there are at least three varieties that have been sent out as the Pocklington, and those who have the true Golden Pocklington must like it, but those who have the green one and the musky one are not very well pleased with it.

My Worden vine was unfortunately burned off at the ground, and it has not had a fair showing to prove its worth on my ground.

The Empire State, that was so loudly praised, was set next to the Naomi. The Naomi winter-killed every year but one that I took pains to cut it back in the early autumn, so that the wood would harden one winter, and the next spring it started out in fine shape, but the fruit completely mildewed and, I think, communicated the disease to the Empire State and that vine was very badly affected with mildew until I removed the Naomi, and it seems to be recovering now. There was some good fruit on the Empire State this year and I am pleased with it, but shall wait another year before I pass upon it.

The Centennial has proved so slow of growth that I can say very little in its favor. The bunches this year were very nice, and the berry a little less than the Delaware. It is very delicious. The purest and cleanest in flavor of any grape I have yet seen. I want some of the other growers to try it to see if it will not grow better, and I know that you will like the fruit.

Moore's Early was planted later and has not had a fair show yet. I like it and will take pleasure in its future.

Some other time I hope to tell you how the newer varieties do on my ground. Please remember that I have but one vine of each, and, therefore, my conclusions are those of an amateur only, and a dozen vines of each kind might lead me to think very differently of these varieties. Further, I have not drawn anything from what I have seen of these kinds elsewhere.

I said that I was having fine success and I presume that you would like to know how I treat my vines. Having told you about the planting and cultivation I will only have to tell you about the pruning and treatment of rot.

I have never dug about my vines in the least. The mulching keeps down the grass and keeps the ground moist.

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In pruning, I commence as soon as the leaves are off in the fall, and sometimes, where there is too rank a growth late, I check the growth by cutting so the wood will harden.

I cut back till I get good, solid wood and strong buds. I want at least two and prefer three good buds on each branch of the year's growth that I save. I often leave longer wood in order to get the buds on the right place on the trellis. Sometimes I want more fruit and if the wood is good do not hesitate to leave a dozen or more buds. I do this pruning any time I get the chance, except that I do not like to handle the vines when the wood is frozen. This is the method of winter pruning.

When the buds start in the spring, I pluck away all that I do not want to produce fruit, and, at this time, take great care to leave the buds that will give the vines in the proper place. I do this any time till the blossoms begin to show, with my fingers, and if I find some that I think had better come off later, I use a knife.

After the vines are well started, I watch and take off the suckers until midsummer.

Just as the blossoms begin to open I begin to thin out the bunches on such vines as I find are inclined to overbear. This is the time and the way to make fine, large bunches and berries.

This summer pruning and thinning is the best lesson that I have learned in the care of the vine. This work, carefully done, has much to do in securing strong canes of well-ripened wood for the next year, and you will probably do it better after you have allowed your vines to overbear one year and had to go without fruit the next.

The rot troubled my vines more than I like, but I managed to escape very serious damage by the following precautions: I find that on my vines, a few days before the appearance of rot on the fruit, there were small patches of rust-red color on the leaves. These patches, if not the breeding ground of the rot spores, are at least closely associated with the appearance and spread of the rot. I found these rusty-red spots on the leaves of every vine that showed rot in the fruit, and the fruit nearest these diseased leaves were the bunches that first showed the rot. I carefully picked off all the berries that had been attacked, and also every leaf, or at least the diseased part of the leaf. I think that I thus prevented the spread of the rot and really stamped it out for this year.

Mildew, I find, usually starts on the fruit, though sometimes the leaves are affected at the same time. The first appearance is a brown tinge on the berries. If these are promptly plucked and destroyed, it (frequently, at least) will stop the fungus growth at once.

I am watching the results of the experiments in spraying, as a cure for these troubles, and hope for good results. Having no experience in this method, I am relieved of any discussion regarding it. I have now, in a running narrative, told you, as near as I am able, my experience with grapes, and, really, have told you about all I could, unless I could take you into the vineyard with me for a year.

You will pardon one outside remark, and that is, that I really believe that the horticulturist has more to learn than is required to learn in almost any other profession.

I hope that you will all cultivate a few vines, and that you will reap a rich reward of green, and gold, and red, and purple grapes, for there are beautiful and luscious kinds of all these colors. If there is any fruit blessed of Heaven, it is the grape. Let us show our appreciation of its blessing by our care, and may our tables be loaded with this noble fruit.

*Richmond, Ind.* ISHAM SEDGWICK.

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DISCUSSION.

*W. H. Ragan.* Mr. Sedgwick said the horticulturist had more to learn than they of any other occupation. I am glad to see that after learning, he is so free to communicate. This is characteristic of horticulturists everywhere. Here is a man who gives us his experience in plain terms how to raise this most luscious fruit. Now, one word as to our success in grape culture. Mr. Downing published a volume in 1845, in which he scarcely stooped to recognize the American grape. After describing a number of grapes he mentioned twelve varieties of American grapes. I think only two of the varieties are now known. The varieties he does mention were seedlings found in fence rows, and hoped that, with protection, the American grape might prove worthy of cultivation. These native varieties are the groundwork for improving our grapes, and where they attempt to use foreign blood for hybridization we seldom succeed, so we have turned our attention to American species. This success that is crowning the efforts of horticulture within so short a period, will be as great in the development of other species recently taken up, as our American strawberry and our raspberry; it is almost wholly an American species. I only mention this to call attention to the neglect of some of our native American fruits. I do not know as any one has experimented with the pawpaw. I predict that in fifty years it will be greatly improved and cultivated in our gardens, and so with the persimmon; but the crowning triumph is in the grape. We never have had a paper of more value than the one we have just listened to. I hope it will stimulate others to amateur work in this direction.

*S. Johnson.* I concur in what Mr. Ragan has said. I have nothing to criticise on the experience of one who has taken so much interest in grape culture as the author of this paper. We should attend these meetings, and we can learn much by hearing such papers as this. I highly approve of the paper. However, there is one thing he left undone, which, I believe, I will mention. Every step he described in the cultivation of the vine, I assent, too, it is my practice. Except my varieties differ somewhat from his; I might change Niagara for Worden. But what I want to say is this, that vines should be protected during the winter. The buds will be more vigorous and fruit

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better, even if the winter is not very severe. Mine are down now and have been for two weeks. Mine are seventeen years old, and I put them down. Prof. Budd, of Iowa, thought the important thing was to have fruit buds protected. I put on almost anything—such as trash and dirt. We are not sure of a crop of grapes unless we do protect.

*James Sanders.* I have forty varieties and 1,200 vines. While I like his selection quite well, I believe still ahead of Worden I would put Moore's Early, which bears well with me. It is a little slow in growth, but it is hardy and not liable to rot. It is a profitable grape and succeeds with me better than the Early Victor, which has been winter killed, and Moore's Early never has. The gentleman will find, when the Brighton gets to bearing, it will come up high in the list. The Brighton does not rot any worse than the Niagara. The Niagara has been fine with me. The Pocklington is of slower growth than Niagara, but a good grape. As to pruning of the vines, in our efforts to follow the vineyards of the old country, we have cut our vines too much away. Grapes should have a good growth of vine. I notice when the Concord gets on an apple tree or building they are free from rot, and the vines make better growth.

*J. C. Ratliff.* There is one question in connection with the grape touched upon in which I am interested, but have not tried it; that is the plan of sacking grapes. It has been tried by some of our horticultural friends in Richmond, and they think it a great success. They claim that it is a protection against birds, bees and rot. A friend of mine told me he put the sacks on when the fruit was the size of peas, and they produced fine grapes. He claimed that it was the result of sacking. Others have tried it and think there is not much in it. I do not know whether friend Sedgwick has tried it or not.

*Mr. Sedgwick.* I have not had any experience.

*Mr. Sanders.* I have tried bagging grapes for several years. It is a protection against birds, bees and rot, and the clusters will be finer. When I exhibit at fairs I always bag.

*Mr. Thomas.* It may be that the soil has something to do with the grape, but as far as I am concerned I join with Mr. Sedgwick in placing the Niagara at the head of the list. It is a rank grower. Brighton is hardy. The Moore's Early grow a little more rank than Delaware.

*Mr. Johnson.* The Brighton rots with me, but it is a good grape.

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*Mr. Eckhoff.* I want to know if there is any remedy against rot beside sacking grapes. I have a little vineyard, planted fifteen years ago, of Hartfords and Concords. They bore continually until three or four years back, since which they have rotted in succession. I have thinned out every other vine to help keep them from rotting by giving air and sunlight. I have hauled to market and sold grapes as high as nine cents per pound, but it seems that I can not raise any more. There is too much work in sacking.

*C. M. Hobbs.* The Department of Agriculture has been experimenting with remedies to prevent the rot, but it will require more time before satisfactory results may be reached. I was about to say the Worden was gaining rapidly in favor and may supplant the Concord yet; it is growing in popularity each succeeding year.

*Mr. Ragan.* The season has much to do with the rotting of grapes. The older vines, if not well cared for, will rot more than those on young vines. Much improvement might be made by cutting back.

*Mr. Ratliff.* In growing such quantities of fruit, there may be much in the locality to bring about a tendency to disease and rot.

The question of holding a summer meeting was referred to the Executive Committee.

The Society was informed that the Society of Indiana Florists were desirous of meeting the horticulturists shortly before their adjournment for the purpose of discussing certain measures relative to more ample space on our State Fair grounds for their annual floral display and horticultural exhibits.

Immediately upon the arrival of the delegation of florists, Mr. Wm. Langstaff, on behalf of the delegation, said:

*Gentlemen of the Indiana Horticultural Society:*

The florists come here to-night to mingle with you, as we are all identified in the same cause, but you as horticulturists and we as floriculturists. The time has come when the floriculture of this country is a business of itself, and that a most important business. The floral exhibits at our State fairs are a very important feature of the exhibition. We have been put in the back ground for want of space or room. Another thing, the agricultural department is not doing what it should do for floriculture and horticulture. Now, our fair grounds are not properly arranged for either one of these branches. They are separate from each other. We want a room where we can display our flowers in such a condition as

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not to be injured. There are men who have plants there worth hundreds of dollars, and after the fair is over have to throw them away. The premiums contended for were nothing compared to the value of the plants. Thousands of people are passing through that large building, stirring up a great deal of dust, which settles on the plants and flowers. The leaves of the plant are the lungs of the plant, and if the lungs are filled up in such a manner the plant is exhausted. These leaves are full of pores, and when they are covered with dust for any length of time they perish. We want a building that will properly represent the great interests of horticulture and floriculture at the State fair. When that hall is built we want it arranged with taste. For instance, the Board of Agriculture should give a premium for the best design in landscaping, and then give a premium to the horticulturists for the best tree planted and left there. This would secure beautiful and appropriate grounds in which to place the hall. I happened to be a member of the Legislature last winter. A bill was introduced appropriating $10,000 for the use of the Agricultural Board. I said, I will give you my vote freely if you will give us a building for horticulture and floriculture. We have not any place where we can make a proper display. They pledged themselves that they would do these things, and a year has now passed and nothing has been done. I gave my vote and gave it freely, because I thought it was just and right, and every person in the State of Indiana would feel a pride in giving the money for that purpose. There is nothing that would do more for the development of horticultural and floral sentiment in the State than a tasty, well arranged agricultural fair ground. I think this association should recommend a hall of sufficient size to put both the horticultural and floricultural exhibits in. I believe that would be the proper way to do it. One take one part of the building and the other the other part. We would then get rid of the dust. If there is not a better place prepared the florists will not go there any more; it is a definite conclusion, for many things taken there is just the same as thrown away, and the loss is heavy. Mr. Reimen, Mr. Bertermann and Mr. Wiegand had plants there last fall that were spoiled. The premiums offered don't justify taking the plants there.

*Mr. Sedgwick.* Like Mr. Langstaff, I think the time has come when we should press this matter with energy and vigor. You who have displayed fruit two or three days, find that it takes the bloom and fine appearance away, so the last few days it is not an attractive display. I am aware of the feeling among the florists, and they, with us, should be heard. There are thousands of people who go there with an eye for the beautiful and want to see these things prosper, and we can not do that unless we have something especially adapted to our needs. We should have something definite from this meeting and the florists, and present it to the State Board in time to have something done by our next State Fair.

*W. H. Ragan.* I do not feel any uneasiness about the success of the matter. I was a member of the State Board of Agriculture for ten years, and I think the Board is now in a condition to put up a suitable building and I feel that it will.

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*J. J. W. Billingsly.* I move that this subject be referred to the same committee having the subject under advisement the past year, with additional instructions to press the matter before the Board.

Motion carried.

NAMES OF COMMITTEE.

On the Part of Horticulture—Messrs. Ragan, Sedgwick and Hobbs.

On the Part of Florists—Messrs. Langstaff, Bertermann and Weigand.

Secretary Hobbs submitted the following resolution in regard to fruits from Dr. Furnas, of California; also, expressing regrets at the loss of Dr. Furnas from the Society:

*Resolved*, That the Indiana Horticultural Society is under obligations to our ex-President, Dr. Allen Furnas, for the very interesting collection of Southern California fruits contributed to our exhibition at our annual meeting. We hereby thank Dr. Furnas for this expression of interest in our meeting and this remembrance of us. We hereby express our regret in the loss of Dr. Furnas to our State, and especially to its horticultural interests, and wish him health, happiness and prosperity in his new home.

On motion of W. H. Ragan, who stated that information had just reached him of the recent death of John W. Wright, late of Switzerland County, a charter member of Indiana Horticultural Society, the Society expressed its regrets and tendered its sympathies to his wife and surviving children.

Society adjourned *sine die.*

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SUMMER MEETING

—OF THE—

# Indiana Horticultural Society,

—HELD AT—

Mitchell, Lawrence Co., Aug. 5, 6 and 7, 1889.

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On the morning of the 5th a half dozen or so horticulturists, on our way to Mitchell to attend the summer meeting, were detained at Greencastle several hours awaiting our train.

We were taken in charge by our courteous friend and co-laborer, W. H. Ragan, and shown about the city. We were shown through the commodious and well-equipped buildings of the large and growing DePauw University. We visited the large plum orchard of J. B. Johnson, near the city. Mr. Johnson has here 100 trees each of Robinson and Wild Goose, that have been bearing heavy crops of fruit the past three or four years.

The trees bore very full last year; this year the crop was light, due to late frost and heavy crop last year. Mr. Johnson has quite an assortment of varieties in younger trees that will in a year or so be fruiting, *i. e.*, German Prune, Lombard and other European varieties, including Prunus Simoni and Kelsey's Japan; pears were fruiting well here. In the city we called at the home of 'Squire Coleman, who grows quite a quantity of plums on his lots. He grows more Robinson than any other variety. His young trees of this variety were almost breaking under their loads of fruit.

Mr. Coleman has a blue plum, a seedling probably of a European variety, as the trees are on their own roots and produce

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the same from the roots. These trees were propped to prevent their breaking under their heavy loads of fruit. We were all favorably impressed with this variety. We secured some fine branches of fruit of these and Robinson for exhibition at the meeting. We met our enthusiastic horticultural friend, W. A. Workman, on the street with his wagon. On invitation four of our party jumped into his wagon, and we were driven two miles south of the city to his home, nursery and orchard. While the dinner was being prepared we were shown about the place. We soon fell upon the blackberry patch. We found the canes remarkably strong and vigorous; the berries large and luscious. Snyder, Stone's Hardy, Taylor and Erie were fruiting. Snyder is as productive as any, and easier picked than Stone's Hardy or Erie. Stone's Hardy is decidedly best in quality. After filling up on blackberries, we came on to the best of all the summer apples in its season, the Benoni; after dispensing with a few good specimens of these and others, we were still able to do justice to the dinner, after which we were driven to the city, and soon to our train, where we found a number of others bound for Mitchell. As we proceeded south we observed the apple crop growing more abundant. The apple crop this year was very light in the central part of the State, with fair crop in southern and extreme northern parts. Arriving at Mitchell late in the afternoon, we were met at the train by Jos. A. Burton, Horace Curry, Morgan Keane and others of the local society's reception committee, and conducted to the hotel for supper, after which visitors were assigned to places in the homes of the members and friends of the Society.

The members of the local society received the visitors warmly, treated them hospitably, and done all they could to make the stay among them pleasant and profitable.

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**Evening Session.**

The meeting convened at 8 o'clock in the Baptist church, and was called to order by the President, Dr. A. Furnas, of Danville. After a few preliminary remarks, it was announced that Dr. Furnas would entertain the Society for a short time with an address on his visit to California last spring. The Doctor said:

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LADIES AND GENTLEMEN: I am not here to-night to say that I know all about California. I have a morbid appetite to hear from others since going over there. I have not a long story to tell to-night. I have learned two things; first, it is a hard job to do what nobody else can do, and secondly, it is equally difficult to try to make an apology when you have nothing to talk about. I did not go to California with my eyes shut, but being something of a fruit grower, and from that standpoint, I found I had yet some things to learn. Trees which I had grown here for a quarter of a century I did not know them there. Apple trees which I had handled for a quarter of a century, when I got out there the growth was so different I did not know them. The Early Harvest has a mark in the crotch which we all think we know, but I could not find it there. The Early Harvest tree is very much like a pear tree, they are so peculiar in their growth. Many people say they would like to see California and the wonderful products of the State, but the distance is so great and the cost so much they can't go. I want to say it doesn't cost so much as one might suppose, and a visit to that country would no doubt be a profitable one. You have heard persons who have visited that country speak of the beauty and sublimity of the canyons, while there are other scenes less romantic. From Ogden, for a distance of 1,200 miles across the desert, this whole country is made up greasewood, sage brush and jack rabbits. You keep looking at this monotonous scene until you get tired and wish for a change in the landscape. At Denver we are 5,000 feet above the level of the sea. You look out and you are convinced of your elevation. If you look to the west you see a range of mountains. They do not look far distant; you think you could walk to them and back before breakfast, but they will tell you that they are fourteen miles away. We take in this scope of country at a glance. You can't tell how far it is. The distance is deceiving on account of the rarity and pureness of the air.

Dr. Ridpath, in his report of the horticultural excursion to that State some time since, states that he had been told that the elevation was so great and the air so highly electrified that a man, after turning on the gas, by pointing his finger at the jet, sparks would fly out of his fingers and light the gas. This seems a strange story, but he was trying to tell of the highly electrified condition of the atmosphere. Here I first saw the eucalyptus or blue gum. It had leaves very much like a willow, but the appearance otherwise bears strong resemblance to the sycamore, so much so that I thought it was sycamore when I first saw the tree. I asked, "How much wheat do you grow to the acre?" The answer was thirty bushels. "What do you get per bushel?" "From one to one and one-fourth cents per pound," which would be about like we get here. "How can you raise it for that? You can't raise wheat here for seventy cents." "I see you don't understand it; you are a tenderfoot." The old forty-niners would buy up a claim and hold it, and only sell in case of necessity, and have been in the way of the development of the country. California is just coming up, and is going to be a great fruit country. I went down to Niles and then to Samosa. On this route we see apricots, prunes, fine horses and cattle. Grass was growing luxuriantly, and everything put on an air of prosperity. I went on to Gilroy, in Santa Clara County, which is a good county. I never saw a bad horse in that county, and I traveled up and down it for sixty miles. When they want to dig a well they drill in the ground and water flows from the pipe. I saw one flowing from a five-inch bore from a depth of twenty-eight feet. Their mode of plowing is very different from ours. I saw a man start out at Stockton with eight horses. He would turn four furrows at once, driving off with ease. Their houses are somewhat inferior to ours, but their barns are immense. The Chinaman will live in the fence corner and lay

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on a board at night. The people of California will tell you wonderful stories of the products of that country. My brother-in-law, who resides there, told me that he was wanting some pumpkins, and one of his neighbors, who had a great many, told him to go over to his field and get a load. He took his one-horse spring wagon, but when he came to load the wagon the pumpkins were so large that he could not lift them, so he got skids, on which he rolled seven pumpkins into the wagon, which made a load, all he could get in.

I saw sweet potatoes in April sprouting in the open ground and doing well. My friend, Mr. Nicholson, who moved from Indiana there a few years ago, stated that he could make a living raising sweet potatoes. He said he could raise sixteen tons per acre and get one cent per pound (they sell everything by the pound), which would make $320 per acre. They tell you these kind of stories right along. This little town of El Modena is the place where they grew and dried their raisins, but there was a disease which attacked their grapevines and they began to shrivel and die. It has gradually spread over the country until there are not many of the raisin grapes now to be seen in that country. The bee men said it was a judgment sent for killing bees, and the temperance people said it was a judgment sent on the wine makers.

Oranges are a great product in Southern California. They have been troubled to some extent by the scale bug, but they are now getting the upper hand of them. The way they handle oranges seems large to us. A little town shipped forty-three car-loads of oranges, and up at Riverside they shipped 750 car-loads last winter, and think they will double it this year. Everything is oranges. They will realize from $200 to $400 per acre. While people are afraid of the scale bug, they have three County Commissioners who have oversight of the orchards. They will come down to my friend and say: "You have scale bug in your orchards, and we command you to destroy them." Under the law they can destroy orchard or vineyard if they deem it a matter of public importance.

The English walnut is said to be a most profitable tree, and you can grow it in California, and not an insect enemy of any kind to bother it at all, and in eight years you can have a crop. It is a tremendous rapid grower, with long branches. They should be planted forty feet apart, and when you get an orchard of that tree you have a fortune on hand. The olive also does well, and will grow and produce fruit a thousand years. Those trees on the Mount of Olives at Jerusalem are thought by some to have been standing at the time of the Savior. Take those that produce oil and you have a great source of profit; the demand is unlimited, and there is but little country that will grow them. The oil sells readily at eight dollars per gallon. If you tend your trees you have an income; that is as sure as water flows down our rivers. There is also much money made on apricots, but more, perhaps, on German prunes. The German prune will fall down on the ground and dry, and get good and merchantable in that way. This prune is very popular with those who want to make money. The Bartlett pear, which is healthy in that country and nice as possible to think of, is a sure crop, and if handled rightly you have a good thing. When I was there the first of April we drove in to see a fine orange orchard near a town called Tuscan City, the finest little place I ever saw in my life. We thought we would ask permission to get a few oranges. We found twenty men packing oranges for shipping at this little town, which is a sample of the orange district. I saw men sorting oranges; I went to them and told one of the men I wanted to buy a few, but they would not sell any. Another said, "Go to that pile," pointing to one, "and just help yourselves," and we did so. That is the way it is there; you get all the oranges and grapes you want. There are com-

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panies there now from New York and Chicago, going around and asking you how much you want an acre for your oranges. This is going on now all the time. It is a great crop. You can there raise apricots and plums to perfection. Peanuts also do well, and are a profitable crop. They can grow Irish and sweet potatoes very successfully, indeed they can grow almost anything we do. We had peas on the 1st of April on the table, and tons of them had been shipped at that date. They are now preparing their ground for winter crops.

Meeting adjourned until 10 A. M., next day.

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**Tuesday Morning Session.**

AUGUST 6.

President Furnas called the meeting to order at 10 o'clock.

Jonathan Beard, of New Albany, read the following paper on "Fruits in the Vicinity of New Albany, and How We Grow Them."

## FRUITS IN THE VICINITY OF NEW ALBANY, AND HOW WE GROW THEM.

The elevation of lands in this locality, so favorably adapted to the growing of small fruits, is from 200 to 500 feet above the Ohio river. The soil is a clay loam, with a red clay sub-soil. When these lands are properly prepared they produce very large crops of the finest quality of berries, especially strawberries. The growing of berries is increasing very rapidly here. The increased average for next year over this will be about thirty per cent. The acreage of strawberries in this locality is about 375; raspberries, 275.

The following is the number of gallons of berries shipped from New Albany the past season: Strawberries, 35,335 cases, aggregating 212,010 gallons. Raspberries, 29,728 cases, or a total of 178,368 gallons. Cherries, currants and gooseberries, 29,600 gallons. This report is taken from the *New Albany Ledger*, and was carefully collected daily by Mr. Cotton, local editor of that paper. Besides these shipments, not less than 20,000 gallons of berries were sold in New Albany and Louisville.

Besides the growing of small fruits, there are grown here considerable quantities of apples, peaches, pears, plums and grapes. More attention is being paid to the growing of these fruits within the last few years than formerly, since big profits in growing berries is a thing of the past. This locality seems to be very favorably adapted to the growing of grapes, and quite an interest in that line is being manifested recently. There are about eighty acres devoted to grape culture in the county. About thirty acres of these were planted within the past two years.

### HOW WE GROW BERRIES.

Many of the growers here are growing berries differently to the way they were grown ten years ago. Strawberries are planted in check rows, thirty inches each way. They are cultivated both ways until the runners are strong, then a single row of plants set. After that, all the runners are cut or pulled off. The advantages of the single row culture over that of the matted row, are: First, much larger,



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more uniform in size, and higher colored berries are grown; second, it is much easier to cultivate them, most of the work being done with the cultivator instead of the hoe. I have grown 1,890 gallons of berries per acre in this way, and seldom less than 1,000. I have had plants so vigorous and so heavily laden with fruit as to hardly give room for pickers to get through without crushing berries. I shall hereafter plant thirty-two inches wide instead of thirty, as I have been doing.

Raspberries, both red and black, are planted in rows from six to seven feet wide. We have discarded staking or any other supports. Young canes of the blacks are pinched back when about eighteen inches high; this makes a stiff, stocky, branching plant, which is self-supporting. We cut back very severely in the spring, causing them to produce strong laterals which is essential in producing fine berries. Reds are not pinched back while growing, but are cut back severely in the spring. The occupation of growing berries has increased so rapidly within the last few years, that, unless we grow something fine, there is no money in it for the grower.

### IS THE BUSINESS OVER-DONE?

When the supply is greater than the demand, at remunerative prices, then it is over-done. The growing of fruits, like most any other business, regulates itself. There was never a truer sentence uttered than that of Darwin, of "the survival of the fittest." It is just as true in business, as it is in animal life. The growing of berries has become so near being overdone, that, unless the grower studies the business well, making every effort to produce the finest quality of fruit, and to put it on the market in the best condition, he will soon be ready to drop out. There is no room in this business any more for the sluggard or the sloven; none but the "fittest" will "survive." I believe it was Daniel Webster who once said, when asked by a young man who was desirious of engaging in the profession of law, if the business was full? The reply was that "there is always room at the top." I do not wish to discourage those who have recently engaged in this occupation, but only to stimulate them and all others to strive to keep up with all the improved methods of cultivation, to learn what varieties suit your locality best; to learn that it is the quality more than the quantity, that gives the best returns. In this fast age, and when all occupations seem to be full, none will "survive" but the "fittest."

### TRANSPORTATION.

The subject of transportation, of getting our fruit on the market early, in good condition, and as cheap as possible, is disturbing the minds of the growers here more than anything else It is very discouraging to the berry-grower, when he has taken a great deal of pains in having his berries picked and packed carefully, and delivered to the express company in good condition, to read, when his returns are received, "your berries were in very bad order; cases had the appearance of being set on end, leaking badly; if they had been in good condition I could have sold them for a good price, but as it was, I had hard work to get $1 for them." I have received just such reports as this. Our fruit is very often handled in Chicago as roughly as if it were a lot of baggage. Now, is there no other way of transporting our fruit to market than through the express companies? Would it not be better for the railroad companies, and much better for the fruit-growers, for the growers to load the cars themselves, and the commission men to unload and deliver the fruit? The commission men are interested as well as the growers to have the fruit delivered in the best condition possible; for it is easier for them to sell a case of berries in good

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condition for $3 than to sell it for $1, when it has been dumped about until the juice is running out of the berries. Besides this, he would be getting thirty cents for the one in good condition, while he would get but ten cents for the other. Our berries have been handled rougher this season than ever before, judging from reports of its condition on arrival.

JONATHAN BEARD.

DISCUSSION.

*Dr. Furnas.* This is an interesting and important subject and we want a free discussion. Some prefer matted rows while others are favorable to hill culture. We want to consider the quality of the soil and mode of culture.

*Mr. Henby, Greenfield.* I have always been taught to believe that the old system was the best and least expensive in growing strawberries. I know nothing of Mr Beard's method of growing at New Albany. I suppose his idea is to get larger berries. I think, perhaps, larger berries may be raised by hill culture. The most profitable way, according to his theory, is to produce the largest and finest berries which brings the highest prices. I can not see anything favorable to hill culture only to get larger fruit, while the yield is not so large.

*J. Webster, Centralia, Ill.* In our vicinity, with 1,300 acres of strawberries, most of the old growers and myself tried hill culture and discarded it long ago. Hill culture is a failure. We never have succeeded in growing fancy berries in that way. I have been at Chicago and seen berries from New Albany much finer than we grow, but the most money I made out of berries was a poorer grade. I have been growing for twenty-five years and sell in the Chicago market, and they never make any complaint about the strawberries and the price has been reasonably good, but it is a fact, without any controversy, that the business is overdone. High prices are gone and we won't get high prices any more, but if the business is handled properly perhaps there is money in it yet. Hill culture is a failure with us. We grow a number of varieties and with us the matted row is best. We keep the runners off during the early part of the season and keep the row cut down to ten inches wide. When the row gets more than ten inches wide you will have a less amount of berries. We get from 150 to 250 cases to the acre. A case is 24 quarts. In our town it is quite a business. Any time, during the season, there are from two hundred to three hundred wagons on the streets, in the strawberry interest. A man can not raise

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strawberries, profitably, without quick transportation. We have a Fruit Growers' Association in our town, of which I am President. We employ a man to handle our fruit, and pay him so much for the season. We correspond with the railroad authorities, to get proper transportation. We have worked fourteen years to get proper arrangements for shipping, and better rates. It costs $80 per car, to ship to Chicago. We pay a man, at Chicago, $4 or $5 per car for unloading; he delivers to the commission men and settles the freight bill. The fruit is all consigned to this man, who unloads it. This is done to secure careful handling. There are some shippers who ship to four or five men. There are, probably, twenty five houses at which our fruit is marketed, but we make our consignments to one man; he collects the freight bills and his expenses, and the commission man sends us the balance. I want to say, that, since we have been shipping in regular fruit cars, our fruit has been handled better than when we shipped by express. We have a shippers' fruit train. We have two branches over which we can ship, the Jacksonville and Southwestern, and Wabash Road, and we hope to get cheaper rates by these competing lines. Our fruit was handled roughly, and the conclusion was that there was nothing in it; but, after inaugurating our present system, we got something out of it. Some of us, this year, have realized as much as $300 per acre. We have a system of cultivating which is cheaper than formerly. We mulch with straw; it costs us something, and is some trouble, but it pays well. We use from seven to nine loads to the acre, but, when we get good loads, about five will do. One of the greatest drawbacks is the cost of mulching, yet it is essential. If they are not mulched they bulge out of the ground.

*Dr. Furnas.* In your cultivation, do you use a cultivator?

*Mr. Webster.* We aim to run the cultivator often. We do less hoeing than we used to. We used to hoe from five to six times, which would cost a dollar a row one-half the length of forty acres. We run through with some kind of cultivator every ten days. If we have strawberries in matted rows, we have a small double plow which turns the dirt over, making a space of about five inches; then we go along and hoe this little strip of ground, as a man can hoe them quite rapidly; the next day you throw this dirt back again and commence cultivating with a five-tooth cultivator, smoothing it down level. It is

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beneficial to have the ground stirred often and made smooth. We use a drag for this purpose; sometimes it serves to retain the moisture. That is our system of cultivating through the summer.

*J. G. Kingsbury.* Is there not danger of disturbing the runners by your system of cultivating?

*Mr. Webster.* Yes, sir; we expect to cut off some every time we cultivate.

*Dr. Furnas.* What disposition do you make of the mulch when done with it?

*Mr. Webster.* That is taken off and put in the furrows between the beds. Some men this year picked over two hundred cases, and done nothing but mow the weeds down; but this was a lazy man's year; we have to generally work to get berries.

*J. G. Kingsbury.* What varieties do you grow?

*Mr. Webster.* We grow the Miner and Crescent principally, using Miner for a fertilizer.

*B. H. Carter, Clayton.* What is your plan for setting?

*Mr. Webster.* We set by running off with a marker. Most of our folks make their rows three feet four inches wide. We plant from the 20th of March to the 20th of April.

*C. M. Hobbs.* How about burning off the mulch?

*Mr. Webster.* It is practiced to some extent, but it won't do to depend on it. I have seen fine fields burned off, the weather would continue dry, and they would never come out. If it rains soon it will do to burn, but otherwise it is risky.

*Dr. Furnas.* What is your opinion of the Warfield?

*Mr. Webster.* The Warfield has much the habit of the Crescent. It makes a good berry to ship. It is becoming more popular every year. If a man buys 500 plants of this kind he don't need to buy any more. They propagate very rapidly.

*Mr.* ———. If you want to plant for hill culture, how many plants would you put in a hill?

*Mr. Webster.* If you want to try the hill plan, two or three plants would perhaps be enough.

*Mrs. Moore, Mitchell.* Do you think straw is better to mulch with than sawdust?

*Mr. Webster.* Yes.

*Mrs. Moore.* Is it better than leaves?

*Mr. Webster.* No. Forest leaves are perhaps the best material we can get for mulching small beds. Cedar boughs are

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also good. Mulching large plantations is expensive, and good, clean wheat straw is the cheapest and best mulch we can get.

*Mrs. Moore.* What do you think of the Jessie strawberry?

*Mr. Webster.* It is a failure with us. It is a soft berry and not suitable for shipping. We are interested in a berry that we can ship to St. Paul if we wish. It needs a fertilizer the same as the Crescent.

*Jonathan Beard, New Albany.* I omitted one thing in my paper of which I will speak here. When I spoke of row culture, what we term a matted row and what Mr. Webster terms a matted row is altogether different. His is hill culture. The matted row in our section is from two and one-half to three feet in width. They trim that matted row and keep it in nice shape. My first experience was with just such a row as Mr. Webster's. I have met many strawberry men, and I generally try to get all the information I can, and I get this largely by asking questions. I believe New Albany has as fine berries as are sold in Chicago, except Barnesville, Ohio. I was told five years ago that they grow there in hills. An old Quaker started the method first. It is hill culture, and finally matted row. I concluded I would grow the same, as their soil is similar to ours. We have little stone, but it is a different soil from yours, Mr. Webster. My first single row culture was ten inches wide, and it was so far ahead of growing two and one-half feet wide that I concluded I would still cut down, and they did well. I have run single rows for five years, but generally from three to four. I generally grow potatoes on my ground and follow with strawberries; I do not think it advisable to plant on sod, as the grub worm often gives us much trouble. We should fertilize pretty highly. After getting my ground prepared I check a row two and one-half feet, and the planters come along and plant in the cross. When time to set runners I aim to have from three to four plants set between these originals, and when growing they look like a row of potatoes; plow right up to them, and they heave but little. In your soil they would heave, but in ours we are not troubled in that way. A strawberry wants to climb up; they will heave in single row worse than in the matted row. I use the Planet, Junior, cultivator, and hill them up a little. Several others are trying this and are well pleased with it.

*Mr. Webster.* Do you mulch?

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*Mr. Beard.* Yes, we mulch and burn off everything. We don't mulch as heavy, perhaps, as you, but cover the ground late in the fall so the plants are covered, but not so heavy as to be likely to burn the plants to death. Sometimes we destroy some plants in burning, but we guard against it as much as possible. I never move the straw in the spring; if the plants are vigorous they will work through. If they become tangled in the straw take a fork and make a place for them to get through. We leave it on for two reasons, to retain moisture and keep the berries clean. So we all mulch and all burn.

*Mr. Webster.* What time do you burn?

*Mr. Beard.* Right after picking. We select a time when there is a light breeze, setting the fire on the side of the wind, and it will run through. After we pick the berries and burn the mulch, if the ground is ready to work, we take a turning plow of the Avery pony pattern, plowing close to the single row, running up with the bar next to the row, throwing the dirt to the left, then turn around and go on the other side, and then, after we get all plowed, take a harrow, with teeth set slanting, going across the row and then back, pulling the loose dirt back; then we cultivate with a fine steel-tooth harrow and Planet, Junior, cultivator, and crush the clods, which puts it in fine condition.

*Mr. Webster.* After fruiting we use a pony bar plow, cutting down to five or six inches wide if the season indicates dry; if not you can get down to four or five inches. We don't burn the straw off, consequently we move it off, putting it in the dead furrows and let it lay there for what it is worth. We can't grow strawberries more than two years successfully without changing. I suppose that burning would destroy many insects, but we can't burn in our locality.

*Mr. Beard.* One of my neighbors had a boy who was burning trash in the field, and the fire got into the berry patch and burned over the patch. He thought it was ruined, but on the burned bed he had double the amount and finer berries. That convinced me that burning in the spring was often an advantage. I do not know why unless it is on account of the ashes.

*Mr. Hobbs.* The chief benefit from burning the mulch is in the destruction of the rust or other fungus attacking the foliage, and the destruction of insects affecting the plants.

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*Mr. Beard.* The Charles Downing is troubled sometimes with blight. The burning is beneficial, no doubt.

*Mr. Webster.* The Charles Downing, like some others, improves with age.

*Mr. Beard.* Last season I lost many Crescents and was compelled to replant, and when we replanted we set the Charles Downing. The Charles Downing is our berry.

*Mr. Webster.* With us we don't consider it a good shipper.

*Mr. Beard.* We consider it a good shipper. The Wilson is a good berry, but this is better.

*Mr. Kingsbury.* I do not understand, Mr. Beard, why your plants don't heave out as those of Mr. Webster?

*Mr. Beard.* Every farmer knows that if the ground is level and water stands, even wheat is liable to heave. That is the trouble with the Illinois soil, but that is different with ours; we have a dryer and more rolling soil.

*B. H. Carter, Clayton.* I am cultivating a new variety of strawberry called the Hattie Jones, which promises to be a very profitable berry.

*Dr. Furnas.* This Hattie Jones strawberry originated with Adam Jones, of Plainfield, and was named after his daughter Hattie. Mr. Carter has got hold of it and it is doing remarkably well with him. I saw a hill of this variety which had 163 berries, and most of fair, market size. I would be careful in speaking too positively in favor of new varieties; but so far as has been tried, the Hattie Jones has done remarkably well. I had Warfield, and he beat me more than half way. We put it on trial; it is a good market berry; plant vigorous, good grower, large, quite red color, firm as Crescent, and as good to ship as the Crescent; flower requires fertilizing about as the Crescent. Mr. Carter has made a crate which, he thinks, will be of value and importance to the fruit grower when we take into consideration its cheapness. It is wide enough to hold two quart baskets, and can be made any length desired. The end pieces are of plank, and the sides and bottom are made of laths. At the end is a pin exactly in the center on the top side, and a corresponding hole in the bottom of the one above, which will just admit this peg; the next drawer is put on in the same way and you can carry it up as high as you desire. When you have added all the drawers you wish, there is a board or lid which fits on the top, and the crate is complete. If you want

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to ship, you have but to tack a lath on the end and the thing is complete. When he exhibited them at my house some time since, those who saw it said it was the simplest thing they ever saw. He makes his crates long enough to cut a lath in two in the middle. A crate holds two gallons.

*Joseph Burton, Mitchell.* I want to know what kind of boxes you use? We use square ones in this vicinity, and quite often they get broken down. I want to know if any use boxes that don't break down?

*Mr. Webster.* We have what is called a Fruit Package Shippers' Association. We manufacture many thousands of cases. We use the Halleck box, which holds twenty-four quarts. In Michigan they use sixteen-quart crates. These crates are not returned, but go with the fruit. It is what we call a gift package. It is used, also, for cherries, blackberries, gooseberries, and some use them for raspberries. Those we use for red raspberries are half size, holding but twelve quarts.

*Mr. Beard.* We use the same sized crate that Mr. Webster uses, with Halleck quart. We think the Michigan quart a little too small. We prefer our kind of quart boxes, and we don't have any trouble about the bottom falling out. We have a factory in our town in which they work forty hands. They make them rapidly, and do good, substantial work. A little girl can make 400 crates in a day, holding twenty-four quarts each. Many use octagon boxes. They are long boxes, but octagon in form, and shallow, with little notches in the corners, where the bottom drops in. Sometimes, if the berries are soft, the bottom will cup up and drop out. We have discarded that and use the square box. We pay for the square box, twenty-four quart case and boxes complete, sixteen cents, and for half cases, of twenty-four pints, fourteen cents. We ship all our red raspberries in pint measures, and hereafter most of the growers will put red raspberries in pint packages; however, the pickers don't like it quite so well.

*Dr. Furnas.* Do we understand that the return of the package is impractical?

*Mr. Beard.* O, certainly, it is a gift package.

*Dr. Furnas.* Mr. Webster, how do you manage your pickers, and how much do you pay them?

*Mr. Webster.* I am afraid I will be tedious. We have a pickers' exchange, and the man who has thirty acres is troubled no

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more than the man who has two acres. The fruit leaves on the train about 5 o'clock in the evening; the picking is all done as a rule by 3 o'clock, then a man can go to town and pick up all the pickers he wants. We have some professional berry pickers. We have what we call six-quart picking baskets which are taken to the field and filled. If the picker is a small girl or boy we give them a four-quart basket. We give checks, and pay two cents per quart for picking. They come around to the window, taking their turn like going to mill, and present their checks and get the cash for their work.

*Dr. Furnas.* Mr. Beard, what is your method?

*Mr. Beard.* Ours is similar, but a little different. We are not into it as extensive as they, perhaps. When we engage our pickers we get boys, and always aim to secure them before the season begins. We have sheds convenient in the fields to which the pickers bring the berries. Some have carriers to go through the patch to bring them in. Each picker is supplied with a stand or holder, which holds four quarts. We send them into the patch and have a man to watch them and see that they pick clean, and that no bad berries are put in. By that means we have them under our control, and have the berries picked just as we want. There are packers at the sheds to receive them as they are brought in, and give the picker a ticket. For two boxes they get one ticket, and four boxes two tickets. We have them engaged for the season, and we tell them that we can't pay until the end of the season, unless on account of sickness. When pay day comes around, all that want their money come around and get it. When strawberries are on, most of them don't want their money until the end of the season, and it is the same way with raspberries and blackberries. We have different colored tickets for different amounts of berries. For instance red for four gallon tickets, and yellow for five gallon tickets. We pay ten cents per gallon for raspberries, and six or seven cents for strawberries.

*J. C. Ratliff.* Do you have any trouble about them eating very fine specimens.

*Mr. Beard.* We can not prevent that. We don't like for them to, but where you have forty or fifty pickers they will eat a great many berries, but it is impossible to prevent it.

*Dr. Furnas.* As to the healthfulness of small fruits, a family who is accustomed to using strawberries seldom, if ever, ex-

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perience an injury from their use. If any are injured it is those who are not used to them and take an overdose. I have had many children come to my house and get sick on them, while mine do not.

*Theodore F. Longenecker, Dayton, Ohio.* I am surprised to hear you say that strawberries will make any one sick. I will, with your permission, summarize your remarks made on strawberries. We have heard Mr. Webster tell of their cultivation in their ground, and Mr. Beard has told how they proceeded. There is practically only this in the growth of the strawberry that we should get hold of. Then practice. We want a good strong plant in order to secure much fruit, a plant that is capable of doing a certain amount of work. This can not be done unless it is strong and healthy, no more than a child can do the work of a man. Therefore, a strong plant is secured by giving them ample amount of space, not crowding them, and whether growing them in a narrow or in a matted row, if the plants are eight or ten inches apart, with good rich soil, we grow fine berries. Plants are inclined to work up. This is true of all soils. It is particularly the case in old beds. If the plant is one year old or more, new roots come out above the old roots. The Crescent will make new roots while there are many old roots. When plants send out runners you may get too many stools, but by selecting plants you need not be troubled with too many stools. These gentlemen have told how we wholesale our berries, but many are interested in the retail business. If you have stood in the markets of Chicago, you have realized the identity of the producer is lost, and he doesn't make as much money as to put direct in the hands of the consumer. The nearer the producer comes to the cousumer the better. We must aim to accomplish this as nearly as possible. There is a berry or two I have spoken of as doing well in some localities and not so well in others. The Jessie is doing well, and also Bubach is doing well on clay soil. As regards fertilizers, the person who attempts the cultivation of the strawberry in this locality will find that manure will bring better returns than poor soil. The labor is more, but surely the returns are better on rich soil than on poor. I apply manure any time. This is in direct opposition to many persons' opinions.

*Joseph Burton, Mitchell.* As to manuring, I wish to say a word. Last season, those grown on ground where stable ma-

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nure had been applied, made a good growth, but a few days before mulching I spread a commercial fertilizer on some of them at the rate of 200 pounds on one-fifth of an acre, and had no rain of any consequence from Christmas until June; most of it lay on the leaves; when these rains came, this went in the ground and the crop of berries was immense. We probably picked 250 gallons off of one fifth of an acre. This fertilizer was washed down and continued the yield of berries on the Crescent for six weeks. I think it was caused by the fertilizer and a little peculiarity of the weather.

*Mr. Hobbs.* What fertilizer do you use?

*Mr. Burton.* This was a Michigan brand, "Homestead."

*J. C. Ratliff, Richmond.* I wish to know something in regard to late varieties of strawberries. I saw, in the way of illustration, a man at Richmond planting three acres of Kentucky; other varieties come in market earlier and as they declined he come in with Kentucky and sold 482 bushels of late berries on the home market for what the first of the earlier varieties brought.

Whether in Illinois you consider it profitable to grow late berries for market after other varieties are gone, is a matter upon which I would like to have some information.

*J. Webster.* The matter of late strawberries with us has been well tested and found not to be profitable for several reasons. Our market is Chicago, and the home market with us don't amount to anything. Our nearest market is Chicago; several ship to Peoria and some to Springfield, but principally to Chicago. When we don't find any market at Chicago we don't find any market anywhere else. A man must be governed by his surroundings; if he has a good home market, that is the place place for him. We don't have much opportunity to make anything off of late berries. Michigan comes right after us. Sometimes they send in fully a week before we are done. I was in Chicago in June, and saw strawberries there from seven different States, and we were not done then.

*A. Glenn, Columbus.* I wish to say a word in regard to burning mulch. It is my impression that much depends upon the condition of the ground at the time of burning, whether it injures the plants or not. If the ground was dry, when fired, it would probably injure the plants. My practice is to wait until after a rain, when the ground would be moist, and less liable to injury.

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*Mr. Beard.* There is really more danger in burning in dry weather; we must run our chances, but I find fewer plants injured when the straw is just dry enough to burn. I burn mine off when the straw underneath is a little damp. I think the gentleman is correct in his theory.

*Dr. Furnas.* Suppose we have a matted row. If we have plenty of plants would it not pay to keep the runners down and set plants right where you want them, instead of making runners? Would this be practicable?

*Mr. Longenecker.* In setting out your plants you put the roots down in an unnatural position, and the new roots begin to come out above. The old roots, at least most of them, are in the ground in a cramped condition, and don't make the growth they would if in a natural position. Set out a plant in March or April and in July you will have a good plant, and probably two or three new ones. Generally, the old plants die first. The first year the strawberry gives some fine berries, but the next year they give, probably, the heaviest crop. So, if you remove a plant, it would not, perhaps, fruit so well the second season. Some of our growers plant in August. I aim to set three or four thousand plants within a week or two.

*Mr. Glenn.* I wish to ask Mr. Beard what his experience is in experimental work, in connection with the Experimental Station.

*Mr. Beard.* As to our new system of Experimental Station work, I will say that I have had but little opportunity to labor in that line. I have had a few varieties in my charge. One was the Jessie, which did poorly with me; it was on poor ground and continued dry weather cut it short, so in that line I could give little practical information.

The meeting adjourned until 1:30 o'clock P. M.

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**Afternoon Session.**

AUGUST 6TH, 1:30 P. M.

President Furnas called the meeting to order at the appointed hour. Theo. F. Longenecker, of Dayton, Ohio, then addressed the Society, extemporaneously, on the "Raspberry," which was followed with close attention. Mr. Longenecker said: "If

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you are thinking of cultivating the raspberry, one of the first things to consider is, will it be profitable to do so? In order that we may secure profit from the fruit business it is necessary for us to understand, at least, the very workings of the details to know wherein we may succeed, and to what will cause a failure. Usually a clay soil is preferable to a black soil that is full of moisture. The plant is more likely to be long lived in clay than on sandy soil. The black raspberry does not do so well on gravelly soil as the red, yet the reds do not always succeed best on gravelly or sandy soil, although I have seen on some sandy soils where it does exceedingly well, where there is no lack of moisture and plant food. For the black raspberry a situation that slopes to the east, north-east or north would be preferable to other slopes; especially is this the case if you are cultivating some varieties that don't fully stand the warm days of August and September. It is quite frequently the case that raspberries growing on slopes in one direction, incline to a healthy condition, while on slopes in other directions are unhealthy. Where we cultivate small fruits it requires very much practice and thought to make it successful. It is necessary that we should have the soil in the best possible condition. The labor and expense in preparing the ground and planting is more than for an ordinary farm crop, and it may cost more than the entire value of a crop of corn; so it is necessary that we don't neglect to have our soil in the best condition. Having determined upon the soil or location, the next would be the 'Preparation of the Soil.' I would prefer in this a soil that works to a good depth, say ten or twelve inches. It is necessary to keep up cultivation during the summer, and soil should be such that the roots will work in the ground and not break with cultivating. The root of the raspberry, like all other plants, will hunt for the food it wants, and if the supply of plant food lays too near the surface we are constantly breaking the roots in cultivating. After having the ground prepared for planting we should then consider the best 'Method of Setting the Raspberry.' The black raspberry, after cultivating a few years, inclines to work on top of the ground; especially is this the case in some soils; the hill or stool will heave and work up. We should prevent this; but how can we do it? We get around this difficulty by making a furrow some six inches deep, and of proper width; set the tips of the black raspberry in the bottom

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of the furrow, letting the roots spread well, and press the dirt over the outer roots and loosely over the young tips, covering this shoot, which is the beginning of a new plant, one inch and a half deep. This will leave the furrow three inches from being filled; then with hoe fill in the whole furrow to a level with the ground. It is necessary to fill in to prevent the drying of the heaping earth in which the plant sets. We might dig a hole and set the plant, but if there comes a heavy rain the water settles around them and as the plant is tender it will not do so well.

"The red raspberry may be planted in the same way; however, it is not so necessary to set quite so deep, because shoots will come up, not from the stem of the main plant only, but from the roots as well. In planting the black raspberry, the distance apart should vary, according to the value of the ground we are working. If the ground is worth $300 per acre, we could not use as much land as if it were worth but $50 or $60 per acre. The black raspberry bushes should be planted at least six feet apart, and on land worth $100 per acre, not less than seven feet apart, and set from two feet three inches to two feet nine inches in the row. You might vary the distance so you could cultivate both ways, if you choose.

"Such varieties as the Souhegan, Tyler, Ohio and some others should be set a little farther apart than the Gregg. One reason for setting the Souhegan, Tyler and some others farther apart is that the plants are inclined to sprawl over the patches and are quite thorny. We can not so conveniently work among thorny berries as those that do not have thorns, and have a more upright growth. The cultivation should be kept up as long as we can work. I do not know as this would apply the first year, but as they get older we can not cultivate quite so early as the first year. My advice would be to keep up the cultivation as long as you can. The one thing necessary when the foliage and plant are in good condition is to keep up growth until frost. Some think the raspberry of the black variety winter-kill. I doubt if any in cultivation in this latitude winter-kill; the injury is done before winter comes. We notice in this month, the leaves are taking on a yellow appearance. The indications are, there will not be a full crop of berries there the following season. If you succeed in getting the black raspberry up to the first of November in good condition,

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there is no danger; if we do not get it in good condition up to the first of November, and we should have a mild winter, it may not do so much harm as a severe one. As to red rasp berries it is not necessary there should be any pruning done the first year, but sometimes after the canes have attained a height of one foot, the terminal bud might be pinched out, which will cause it to throw out laterals. The second year when the black raspberry reaches the height of eighteen inches, the terminal should be pinched off; we should go over the patch several times, and for a week or two, when the young shoot is tender it may be pinched off with the thumb and finger, but if it grows a few inches it should be cut with a knife, as it makes a smooth cut and does not injure the cane. By this process you procure strong laterals; these laterals lap over, reaching to the ground, and if no pruning is done until spring, you then cut them back to eight or ten inches of the main stock; but in this matter you should be governed by the fruit buds and vigor of the laterals. Some buds are closer together than others, and you don't need to leave the cane so long. The red raspberry needs no pruning. I believe some do practice pruning of the Cuthbert, topping it to a certain height, but I think it is not necessary. The soil for the red raspberry need not be so fertile as that for the black raspberry. It is possible if you manure heavily you get it too fertile and it will throw up long canes; if you top at the proper height, you cut away the best fruit buds, because they are found near the end of the cane. I do not like to cut off more than six inches or a foot of the red raspberry. In the cultivation, I may also speak of the propagation of the plant. The black raspberry, at this time of the year, we are beginning to cover with earth the tips of the laterals that reach the ground; this end takes root and a new raspberry root is formed, which will be ready to transplant the following spring. In gathering the berries, we practice somewhat the same method as that in gathering the strawberry, and perhaps it is not necessary to speak of that. The red raspberries you sell best in quart measures; but the black raspberry depends on how far you are shipping them and the markets to which they go; some prefer them in drawers and others in quart measures, we try to accommodate the wants of all."

*Dr. Furnas.* How do you hold your quart measures when gathering?

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*Mr. Longenecker.* A very simple way is to take corn fodder twine, by means of which the basket is tied to the picker; he can then use both hands in picking. In picking raspberries, as the season advances, we have berries of different grades; it is here that the grower has an opportunity of showing to the retailer and consumer that he can do honest work. It is necessary that you pack your fruit in such a way, that when you see the top of the basket you see the quality of the fruit all through. He can rest assured that in our market "honesty has a market value." We should be honest in this work. If you are filling a drawer with berries made up of different grades, both kinds should run up parallel with each other, letting the small come to the top as well as go to the bottom. It is by work of this kind in disposing of the berries that the grower can be paid for his labors. When berries are scarce and high-priced the grower can work more carelessly than when the price is lower. It is sometimes necessary to avoid these low prices by selling directly to the consumer as near as possible, and not allow goods to pass through the hands of too many persons. How foolish it would seem for the farmer, if he wanted to sell a $150 horse, to allow this horse to go through the hands of another person and take ten per cent. commission or more for selling it; you would say it would be a foolish piece of business when he could put it in the hands of the buyer direct. If we can avoid a commission man it would be best, though he may be honest. In some localities the grower can find retailers who will handle your berries and save the commission. I have one man to whom I shipped ten bushels of red and black raspberries, and no commission man between, and got good returns. In growing for market, one of the first things coming to the mind of the grower is, what varieties shall I plant? And with how much emphasis you ask this question, as if the success of the whole enterprise depended on this or that variety; as though some particular variety possessed all merit, and was the only berry to cultivate. If you are going to ship north it would be well to select early varieties; if growing for home market then you don't want too many early black raspberries, because as long as strawberries are in the market early black raspberries will not be in demand. In some localities the demand for black raspberries is decreasing. For black varieties the Souhegan and Tyler are two good berries, and very nearly



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alike. The Palmer's Early is quite likely a seedling of the Souhegan. The Doolittle is a good plant, but hardly as profitable as the Souhegan. For late black raspberries, if you are where the Gregg succeeds it will do well, but in many localities it is not a safe variety to plant. The Gregg does well for shipping; it is not a home berry. You want that which will sell to the best advantage. There is another berry, the Ada, as late as the Gregg and hardier; not quite so large but very nearly. Of the red varieties of raspberries, the Turner has been found early, reliable, productive and also of good flavor, and in many localities it is quite profitable. The Cuthbert comes in a little later, is firm and some prefer it; yet you find neighbors side by side, one cultivating the Turner and others the Cuthbert. We find these preferences. Should the Marlborough be a little more vigorous in its growth, I should prefer cultivating it to the Turner. It is more productive and will sell better in the market. On some soils the Brandywine and Thwack are desirable varieties to cultivate, yet before planting many we should test them on the soil where we expect to plant. We often find quite different results in the same field. The color of the red raspberry has much to do with the selling, the flavor very little. In selecting for market it would be well to select those varieties that sell best. If people want a certain variety and are set in their notion as to that variety, don't try to convince them differently, but sell them what they want. The Shafer is a hybrid, between the red and black varieties; it is purple in color and is considered worthless, yet I grow some, as I think them good for jelly and jam, and some like them for table use. In speaking of the Shafer raspberry I am reminded of the man who presented to Mr. Lincoln a model for a patent. It was very ingenious but homely in its construction. After showing it to Mr. Lincoln he said to him: "Don't you think it a good thing?" "Yes," replied Mr. Lincoln, "if a man wants just that kind of a thing, it is just what he wants." This is my notion of the Shafer. I do not think a person should have over 100 Shafer raspberries. In growing 5,000 plants 200 or 300 would be enough. Three bushels of Shafer's among twenty bushels of others would give you trouble. The commission man and groceryman don't want to handle them. We need not expect to receive as high prices for our berries as we did a few years ago. To-day they may

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sell for $5 per bushel and in a few years they may sell for $1 per bushel. I doubt whether raspberries can be grown year after year at an average of less than $1.75 a bushel. It is possible to have a yield of ninety to one hundred bushels to the acre. An average yield, good and bad, is, perhaps, not more than fifty bushels to the acre. Sixty or seventy bushels would be a good crop. In doing anything you should first count the cost, and engaging in the small fruit business is no exception; yet, if the intelligent and careful worker disposes of his crop to the best advantage, there is a profit in the culture of the raspberry.

DISCUSSION.

*J. G. Kingsbury.* Tell us when to plant.

*Mr. Longenecker.* Either in the fall or spring, owing to the character of the soil.

*Dr. Furnas.* How about mulching?

*C. M. Hobbs.* We shall not recommend fall planting without mulching.

*A. Glenn.* I do not have to plant in the spring, since I plant in the fall and mulch. The Shafer is productive and the largest berry, but requires rich soil and high cultivation; but when we get it to market we don't know what to do with it.

*Mr. Hobbs.* We have found for family use the Shafer is the best we have, and for canning in particular. It has partly the flavor of the acids and some of that peculiar musky quality of the red, and is always a vigorous grower, but for some reason it don't always come through the winters in good shape. Last winter was very mild, and when spring came we found they were killed almost to the ground.

*J. C. Ratliff.* Do you prune the Shafer in the fall or summer?

*C. M. Hobbs.* Pinch the terminal bud when two feet high and cut the lateral back in the spring to twelve or fifteen inches.

*Mr. Ratliff.* I call to mind a large patch of Shafers that were killed two years ago. It was attributed to close pruning in summer. Some think the less you trim the better.

*C. M. Hobbs.* I am of opinion that the injury to our plants occurred during the summer or fall—an attack of fungus, probably.

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*Mr. Longenecker.* Where the Shafer has made a vigorous growth I have cut off all the laterals, leaving about three feet high, and they went through all right. Do this in the spring. In pruning the black raspberry and Shafer it is safe to prune when the buds begin to swell. There are instances where persons prune early and there would be little fruit, while on those pruned later there would be a good crop. Another advantage in late pruning—you can detect all the wood injured and cut it away. I planted the Shafer some years ago and found it would not sell. Where they would buy the Shafer one year the next year they would buy less. Now there are not many bought.

*J. Webster, Centralia, Ill.* My experience corresponds with Mr. Longenecker. It don't bear acquaintance. It is the worst thing to handle and no money in them. I tried shipping once or twice to Chicago and never got anything for them. We have now about sixty quarts a day and have trouble to get them off my hands.

*J. G. Kingsbury.* I wish to say a word in favor of a berry suited to amateur growers; the berry I allude to is the Superb. It is a fine berry, yet you hear these professional men say nothing about it. For family use there is no finer berry growing to my notion. It is of fine flavor and handsome in appearance.

*C. M. Hobbs.* The most trouble in marketing the Shafer is its bad color. They have, however, in Grand Rapids, I understand, made a market for them. I wish to hear a few words in regard to the Gregg; this year it is much better than usual in quantity. I wish to ask how you regard it here as to quality. It flourishes here as I have seen it nowhere else, and you can grow it more profitably, perhaps, than any other variety.

*Joseph Burton.* When we talk about raspberries here, we mean the Gregg, because it is the raspberry for this part of the country, and far ahead in appearance and yield. Our Greggs grow large here; we had some this year ⅞ of an inch in diameter. I wish to hear from Mr. Sears, as he is growing the Gregg extensively and does not mulch. My method of growing raspberries is to mulch. While this may not be practiced on a large scale, but in growing a few, it is undoubtedly the way to raise raspberries; you do your work on them before the busy season begins; this mulch makes a good manure, also. In the summer we pinch the terminal buds.

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*Mr. Henby, Hancock County.* I agree with Mr. Hobbs. I think the qualtity of the Gregg was much better this year than last. As for hardiness, for me they are as hardy as any other kind I have. This season I raised some of the largest berries I ever had. I am a new beginner in the fruit business. There is one thing I find in fruit boxes that I do not understand. I want to give honest measure and I find some boxes don't hold enough while others hold too much.

*J. Webster.* The Halleck box is the best kind we can get; they are manufactured in Tennessee.

*W. F. Sears, Orleans.* I have grown the Gregg raspberry for six years and never met with a failure. Two years the season was dry and the berries were not so good in quality as this year. My method of planting is six feet one way and four feet the other; they take up all the ground at this season of the year. I agree with Mr. Hobbs that they were a little better in quality this year than we have had lately. I grow no better berry than the Gregg.

*Mr. Hobbs.* Where is your market, and what do they average you in price?

*Mr. Sears.* My market is Chicago. I suppose I realize an average of 35 cents per gallon after paying expenses. I can make money raising Gregg if I get 15 cents per gallon clear. I gathered 2,263 gallons off of three acres of ground, and got $650 clear for what I shipped, after the commission was paid.

*Mr. Longenecker.* There is one variety I overlooked which is grown considerably for market, that is the Ohio. The berry is as large, perhaps, as the Gregg. I get reports from different sections of the country of the condition of different varieties. When a berry does well for one man that is the berry for him to grow. When a variety is not doing well in a neighborhood we should not recommend it for that part of the country. I have not been cultivating the Golden Queen. The Caroline is fine; no matter what other berries are worth they are from 5 to 8 cents better in price.

*J. Beard.* I have grown both Superb and Shafer, but have discarded them. The Superb is tender and falls to pieces when picking, and has a rough appearance. It is like the old-fashioned Touch-me-not, falls to pieces at the very touch. The Shafer is vigorous and productive, but like some others I can not sell them. It has a rusty, half-rotten appearance, and if they stand

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a short time they get soft. As regards the box business, we can not control this. If the consumer will pay me as much for a wine-measure box as for a dry-measure he gets it. I introduced dry-measure boxes in our section and used them two years; some of my neighbors got wine-measure boxes and were getting as much for berries as I. I made some inquiries and found they will pay as much for wine-measure as dry; so if they would pay just as much for wine-measure we are going to give it to them. At our factory in New Albany they manufacture boxes intermediate between the two extremes.

*Dr. Furnas.* The Brinkle's Orange is the best flavored berry in the world. I have grown it, and it is most delicious, but could not get enough of them. It is tender. Have mulched them and covered up with dirt to protect them, and could not do anything with them. I am favorable to the Shafer and want to get some plants. Mr. Workman, of Greencastle, claims that he can grow twice as many Shafers as the Gregg on the same amount of ground. He has a local trade and don't ship to Chicago. Our folks at Danville take the Shafer as quick as the Gregg. As to strawberries, I can not grow the Kentucky and make money on them.

### DISCUSSION OF THE FRUITS ON EXHIBITION.

*Dr. Furnas.* I present here the Carolina Red June. Reuben Ragan called it the Wilson's June. The start of this tree in our section was in 1821, in which year he went to Richmond and got fifty trees, taking home as many varieties as trees; carried them on horseback. When night overtook him he tied his horse to a limb, fed it, ate a cold supper and went to bed. This is a fine apple, but on my place it is of little value. I can not raise them; they are scabby and indifferent. I had a friend call on me from Kansas last summer who was going to plant a thousand Red Junes there. They are smooth and nice there, and in good demand at the lead mines where he lives. I would like to know what makes the scab?

*Mr. Hobbs.* It is a fungus.

*Dr. Furnas.* Could there not be some kind of an application of sulphur that would kill this fungus? I hold in my hand the Golden Sweet. It is not a nice tree in the nursery, but a grand summer apple.

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*C. M. Hobbs.* In Washington County it is one of the most productive and reliable bearers grown. It is not perfectly hardy in tree in the central part of the State.

*Dr. Furnas.* Here is the Flemish Beauty pear which is one of our best varieties. Here is also a cluster of Robinson plums which was brought to notice by Dr. Robinson, of Coatsville, Putnam County. It is a Chickasaw, and an immense bearer. It is not a fine plum in quality, yet it is, perhaps, as good as the Wild Goose. I also present a cluster of blue plums in color. We came across them yesterday in the yard of 'Squire Coleman, at Greencastle. Mr. Hobbs thinks it is of European extraction. I do not know the name; it is probably a seedling.

*C. M. Hobbs.* I want to recommend the Benoni apple. I have known it for a number of years as a very prominent one of the very best summer apples of its season. It combines more desirable qualities than any other variety of that season. In quality it is next to the best summer apple we have, which is the American Summer Pearmain. The Benoni is the nearest approach to this, the best flavored of all summer apples, but the Benoni is a better tree, better grower, earlier, more abundant, and regular bearer; it cooks well, sells well, and eats well.

*Mr. Webster.* It is one of the best shipping apples, and keeps the longest after shipping. They are now being shipped by carloads.

*Mr. Hobbs.* The trees are absolutely hardy in central and northern Indiana.

*Dr. Furnas.* I want to say a word in reference to the Chenango. The bark of the tree is a greenish yellow, a very hand some apple, and an immense bearer. It is called the Chenango Strawberry, or Sherwood's Favorite. Here is the Maiden's Blush; you take the American Pomological Society's Report, where the standing of varieties is indicated by stars, you will find the Maiden's Blush is at the head of the list, and has more stars than any other variety in the United States and Canada.

*Mr. Webster.* The American Summer Pearmain and Maiden's Blush stand at the head of the market in Liverpool.

*J. Beard.* The Chenango Strawberry is green yet, but highly colored when ripe; good size, and there is no better flavored apple. It is profitable. I sold some yesterday in New Albany for fifty cents per bushel.

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*C. M. Hobbs.* The apple in appearance is very much like the Summer Red Stripe, about the same season; trees and quality quite different.

*A. Glenn.* The Tetofsky is a vigorous grower; upright, very compact, and might be planted nearer together than many others. It might be planted fourteen feet apart. I think it a good apple; good size; yellow; early.

*Mr. Stacy, Green County.* I agree with the gentleman in almost everything he said. However, it is not so large as he described. It takes an acid to make a good cooking apple. It is beautiful, and seems when picked to retain their fine flavor. It is a nice tree; limbs upright. I wish to know about the Arkansas Black and Chronicle?

*Mr. Webster.* The Tetofsky is a slow, straight grower, making but little top in the nursery. The fruit is small, not much larger than Whitney Crab, and very much the same color and shape.

*C. M. Hobbs.* I think the gentlemen are describing two different apples. Mr. Webster has the Fourth of July, which resembles the Tetofsky very closely and is often mistaken for it. The tree is an upright grower, young shoots long, dark reddish brown; fruit medium or below, roundish oblate conical, slightly ribbed, whitish yellow, covered with a thin whitish bloom, striped and splashed with bright red; flesh, white juicy, brisk sub acid; season, middle to last of July. The Tetofsky is an upright, somewhat spreading grower, not so erect and compact as the Fourth of July; the limbs are stouter, not so long; the color of the young shoots is a brighter red and the leaves longer; fruit medium, oblate conic, often nearly round, smooth, yellow ground, more or less striped with red in the sun, covered with a whitish bloom; flesh white, juicy, slightly acid, fragrant; season, last of July and first of August.

*Dr. Furnas.* I have grown the Chronicle for a number of years, getting my first from Reuben Ragan. I do not think it as good as the Baldwin. It is a reasonably good bearer, highly colored and long keeper.

*J. C. Ratliff.* I desire to hear a few words of the Trenton Early. It is an old variety. My father cultivated it among his first and it was one of the most popular early varieties he ever tried. It has proven in later years to be tender. I do not know of but one bearing tree in our county to-day. It is too

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tender and fruit irregular, and there are often hard, dry places in the apple. They may do well here but are not to be recommended for our locality.

James C. Ratliff, of Richmond, offered the following resolution relative to Dr. Furnas removing to California, which was unanimously adopted:

WHEREAS, We have heard with regret that Dr. Allen Furnas, the honored President of the Indiana Horticultural Society, has concluded to make his future home in California; and,

WHEREAS, his active connection with this Society from its organization to the present, and his earnestness in the cause of horticulture, his untiring efforts in the introduction and dissemination of choice fruits; and,

WHEREAS, The most friendly relations and kind feelings have existed for so many years between us; therefore, be it

*Resolved*, That we extend to him our most sincere wishes for prosperity, happiness and long life in his new home, and earnestly commend him to the friends of horticulture in California, whom we feel sure will be the gainers in what we regard as our serious loss.

REMARKS.

*Dr. Furnas.* I should certainly have ruled anything of this kind out of order if I had known what was coming. But without any joking this is to me rather a serious matter. It is one upon which if I wanted to make a speech I could not, and I can only say that I thank you most heartily for this expression of regard.

*C. M. Hobbs.* I have been rather intimately associated with Dr. Furnas, since moving to his part of the State some fourteen or fifteen years ago. He is a man full of vim and progress, continually reaching out after better things for himself and others. He is possessed with an unusual degree of energy and public spirit, and has probably done as much or more for the general advancement of his neighborhood and county (and in no small degree that of the State) as any other one person. He has labored with uncommon zeal and effectiveness in the interests of schools, Sabbath schools, temperance, agriculture and horticulture. In his long and useful life he has done an immense amount of good. Though advanced in years, he is still young and enthusiastic. I often speak of him as the youngest old man I know. I could wish nothing better for us all than that in our riper years we may be as vigorous and useful as he. I speak these words of appreciation in no sense of flattery, for they are justly merited. I believe in breaking the

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alabaster box before burial, that the living may feel that their efforts are appreciated, that they may be stimulated and strengthened in their noble living.

*J. G. Kingsbury.* He has been foremost in every good work, assisted in the organization of this Society and has prepared many valuable papers on horticulture and agriculture, especially horticulture, and has done much in various ways towards advancing this great interest. It is becoming that the Horticultural Society should tender him such recognition of his services. He is a man whom we will miss more than any other connected with the Society. We desire to hear from him frequently in his new home.

*Dr. Furnas.* Allow me again to thank you for this token of esteem. As there is other business yet to transact, perhaps we had better proceed with the business before us.

J. Webster, of Centralia, Ill., read the following paper on "Benefits of Horticulture to a Community."

*Mr. President, Ladies and Gentlemen of the Indiana State Horticultural Society:*

Your Secretary has invited me to your summer meeting at Mitchell. I am glad to meet you on this occasion, and hope you will bear with me in my attempt to address you on the benefits of horticulture to a community. "Horticulture—this is an art which doth mend nature." It is a fact that horticulturists in Indiana and Illinois have done very much in the last thirty years to improve the previous condition and modes of living in city and country. Yet as a class they do not become millionaires, but, on the contrary, die poor. As business men they will compare favorably with those in other occupations and professions. They at least have the satisfaction of knowing that they are helping to make the world better by producing abundance of cheap fruits, and thus educating the people to their domestic use, thereby promoting health and happiness. Horticulture in the tropical zone, nature's hot-house, when compared to *ours*, in the temperate zone, is a life of luxurious idleness. Nature has so provided that the dwellers in the tropics, with but little effort on their part, can gather the most delicious and nutritive fruits, and of late years the people of the North are consuming vast quantities of these, which are moved in train loads daily through a greater part of the year from New Orleans to Northern and Eastern cities. Bananas are now as much in general use as any other one fruit product. I am informed by men who are in a position to know that fifteen years ago a car load of bananas could not have been sold in any city north and west of New York City. The men who are provided by nature with the plantain, guava, bread fruit and banana are not to be compared with the hustlers who are engaged in strawberry, pear and apple growing. Nature wears a sterner aspect to us. The horticulturist in Indiana and Illinois requires more backbone. It is our business to provide fruits for the great Northwest, where apples are a luxury any time in the year and apple growing is still an experiment.

Were you, my friends, ever visiting at the home of a relative or a friend that is farming on the treeless prairies in the great Northwest, where they have planted

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trees of so-called hardy apples and crabs for the twentieth time and still they blight and die? Did you observe how careful and terribly in earnest his three boys were to remind pa when he started for town not to forget to purchase some apples? Apples are the dream of the boy's early days. What would these boys give just to be in one of your Indiana orchards long enough to fill up with apples? It would do your soul good to witness the pleasure and satisfaction these boys get out of a basket of very poor apples, on pa's return from town, that have cost forty cents a peck. Boys are plenty in very many places in the rapidly filling up Northwest, but apples are so scarce that the demand for Jamaica ginger in summer is very limited.

It is an axiom which no one has attempted to controvert, that he who makes two blades of grass to grow where one formerly grew, is to that extent a public benefactor. Within a radius of fifty miles of Rochester, N. Y., there are 26,000 people employed in horticultural pursuits, picking berries and similar work, three months or more in the year. There are 1,500 fruit evaporators within the same radius that give employment during the late summer, autumn and early winter months to 30,000 hands, whose wages average from $4.50 to $10.50 per week. The production of those evaporators last season was thirty million pounds of dried or evaporated fruits. This product is from the labor, very largely of women, and of girls and boys under seventeen years of age. The principal countries purchasing and consuming this product are Germany, England, Belgium and France, with over two million dollars at first cost. Yes, I imagine some one will say, but we don't want to introduce any industry in our community that will take our mothers and daughters from their household duties to field work. It will make them coarse and unladylike; the tendency is bad. "To the pure all things are pure." My friends, are you sure that your conclusions are not wrong? It was my misfortune to be raised in a community, when a boy, where the people were nearly all poor and nearly all workers, regardless of sex. Some of the most loving mothers, amiable, intelligent and affectionate wives and daughters went forth to battle with life from this community. Mothers and daughters that, besides attending to their household duties, picked and packed berries and the various fruits in season, and were not above helping on the haymow or hay-rick in case of an emergency. Field work need not necessarily, in moderation, prove demoralizing to our mothers and daughters. It is attended with more wear and tear on clothing than household work, but a healthy girl or wife can stand one-third more work in the open air, when not excessively hot weather, than over the kitchen stove. Out-door work will never hurt a woman with good judgment.

In southern Illinois there are, between Cairo and Centralia, thirty thousand people, more or less, through a great part of the year (all of the summer months) engaged in horticultural pursuits. Cobden, a thriving village of 2,000 inhabitants, forty-eight miles north of Cairo, in the hill country, ships often, through the summer months, from five to fifteen car loads of perishable products per day. Between two and six o'clock may be often seen 300 teams on their streets that have brought loads of garden and orchard products to the depot. Large quantities of tomatoes, squashes, cucumbers, beans, apples, pears, plums, peaches, etc., are now going forward. July 13 ten cars were loaded, since then thirty to fifty car loads per week of tomatoes alone. The wildest dreamer in 1859 could hardly have conceived that the three following decades would witness such a steady growth, until 1889 finds southern Illinois shipping to northern markets two to five train loads daily of fruits and vegetables.

Modesty compels me to say but little in regard to what horticulturists are doing at Centralia, Ill., but it is sufficient for me to say we are keeping step to the music. Over 300 car loads of strawberries, raspberries, gooseberries, cherries and black-

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berries have been shipped from our end of the State—157,000 cases of twenty-four quarts—one-third to one-half have been picked and packed by our mothers and daughters, which represents a cash earning, at 50 cents per case, of over $77,800. There has been shipped from Centralia at least 183 car loads of strawberries, raspberries, cherries and other fruits, and including blackberries, not yet done, besides from one to three car loads of early apples per day through July. It takes no argument to convince the merchants and business men in the towns and villages where this horticultural product is grown and shipped, that the art that doth mend nature benefits a community. Horticulture furnishes the soap that greases the wheels that keeps the machinery in running order, from the man who hoes our strawberries and the woman who toils at the wash-tub to the banker who cashes the checks for the shippers. In 1861 fifty quarts of strawberries, daily, could hardly have been sold in our town at any profit to the grower.

In 1889, it is estimated, 50 cases daily in season can be used. In 1860, 200 cases could not have been sold at a profit to growers in any city or town west of Cincinnati, Ohio. Now in our town, of 6,000 inhabitants, from $800 to $1,100 are paid out daily to pickers by berry growers at the picker's exchange during the busy strawberry season; besides this there are very many who cash their picking checks at their packing sheds daily, and others at the end of the season. This finds its way into the hands of the grocer, butcher and baker, and dry goods merchants, etc. The people who do this work and earn this money are every evening, to the extent of its purchasing power, supplying their real and imaginary wants. Five hundred dollars to $800 weekly is paid out in our vicinity for labor in keeping down weeds in our gardens and berry fields. The apple buyers through the summer months pay out from $100 to $300 and over per day, which has a tendency to oil up the wheels of commerce.

It is well for new beginners in horticulture to remember the old saw and not carry all their eggs in one basket. Every year we are confronted with difficulties that in the commencement we had not been led to expect. But as in every profession and occupation in life, pluck and perseverance, tempered with good judgment, is necessary to success, there is still room at the top.

One hundred years ago one of the wise rulers of Europe had appropriated $30,000,000 for a series of years to the developing of agriculture among his people. Vast and desolate plains and wild morasses and swamps were reclaimed and made to blossom as the rose. This country is now recorded among the most profitable gardens of Europe. Through the efforts of a few individuals in a German village, with very limited means, there are now one hundred and eighty-four agricultural stations in the German empire; and the foundation of an industry was long ago laid which to-day controls the sugar market of the world.

Through the indomitable energy and perseverance of one man, an experiment station has been successfully conducted for nearly a half century at Rothamstead, England, which has been of great and lasting benefit to the world, besides demonstrating the fact that crops may be trebled under favorable climatic influences by a small additional outlay and an intelligent application of labor.

The horticultural resources of your surrounding country untouched will certainly in the near future warrant an outlay of money and labor that will be of vast benefit to your town and community. The possibilities of horticultural industry are almost without limit. It remains with you as business men to say if you will help to develop this industry, and help to grow such fruits as are adapted to your soil and climate; that are and will be in demand in the cities, towns and country of the great northwest, and thus bring back the shekels with which to oil your trade and commerce.

J. WEBSTER.

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DISCUSSION.

*J. C. Ratliff.* We have a Horticultural Society in Wayne County, the oldest in the State. It was organized soon after the State Society, and has been kept up ever since. Next Saturday will be our regular meeting for the month. The influence of that Society has been admitted by the most prominent citizens to be greater than that of the Agricultural Society. While we have introduced all the fine fruits we could get, in addition to that, we have made it an educational society by having some of the best talent we could get at home and abroad to discuss subjects of special interest. Some of these essays have been published in our papers, and have done much good in that way. The social element is also a prominent feature with us. The meetings are held at the houses of members, and it serves to stimulate people to fix up their premises more than they otherwise would. We meet all on a level, spread out our dinners together, and have a good social time. Our Society has in this way progressed, and now embraces as members some of the best people in our county. I can testify to the good influences of the Wayne County Society where I live.

*Dr. Furnas.* I remember the first time a meeting was held on our grounds. I went home and told my wife that the next horticultural meeting was to be at our house, and what a consultation we had. Something had to be done. There seemed to be more weeds growing around than before, and need of more paint. We laid our plans as to what had to be done. We fixed for it and had a good time. The neighbors come in; we feel better; improve our ideas and make home more pleasant and attractive. I am one of those who believe in a pleasant home; there is nothing like home to me. When it comes our turn to go somewhere else I want to take my wife; she notices some things I do not. We find it pleasant and profitable to attend the meetings together. We feel we have been very much benefited in Hendricks County through the County Society. The last meeting to be held at our house was a failure, very much to our regret, on account of inclement weather. I don't want to go into a community that won't work in this way. I hope I won't get into such a community when I go West. I expect to raise some fruits there that I can't raise in Indiana. Still I will always have a high veneration for old Indiana. I want Indiana to go on; there is a grand future before her;

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but Indiana will have to make some changes; we have too many kinds of fruits. Twenty-five years ago we hitched on to the Ben Davis, but it is not the apple for Indiana, but the Grimes Golden is. It is always in demand, and we can ship it almost to the ends of the earth; it is a healthy, hardy, nice tree. The Indiana Favorite is a profitable apple. We are finding out these things, and have corrected our nomenclature very much in the past few years. We claim we are educators; each one has different ideas, and we are constantly learning from one another.

The Society adjourned to meet at Donaldson's Cave at 9 o'clock A. M., to-morrow.

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**Wednesday.**

The visitors and members of the local society met at the Presbyterian Church at 9 A. M., where hacks and carriages were waiting to convey the company to the caves to spend the day.

One hundred or more horticulturists pulled out from Mitchell, expecting to have a jolly, good time, and they were not disappointed. The weather was all that could be desired, and the scenery about the caves surpassed our expectations. Our first stop was at Donaldson's cave, four miles east of Mitchell. This cave is at the head of a deep, romantic glen, with steep, rugged wooden sides, which looked to be insurmountable; but this was too much of a temptation for the exuberant spirits of Dr. Furnas, who at once challenged some of the other boys to make the ascent, which was successfully done by swinging to bushes, boughs and things. A strong stream of clear, cold water gushes out of the cave and comes dashing and splashing over the rocks, down the glen. On entering the glen we were met by a cool, refreshing air; we followed the stream, crossing and recrossing on the slippery rocks, which proved too treacherous for some feet, and the owner would catch his or her breath as their pedals entered the cold, dashing stream. The party finally reached the cave, which proved to be quite commodious, as it would have accommodated three or four hundred more than our party. Torches were lighted and the party entered some distance and sang some familiar songs with

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very pleasing effect. The party reluctantly left these pleasant scenes, and retracing our steps one mile, we descended into a deep valley in which is situated Hamer's, now Turley's mill. This is probably the oldest mill in Southern Indiana.

It is a substantial two-story stone building, still doing good work and having considerable patronage. The power for the mill is furnished by conducting in a wooden aqueduct two or three hundred yards a part of the water that pours out of a cave at the head of the valley. This valley is larger than the one just visited, and is equally as romantic and picturesque. Besides the mill, there are one or two dwelling houses and a distillery that, we are glad to say, has passed into innoxious desuetude.

Near the residence is a large, cool spring of water, over which is built a stone spring house, the best place in the world to keep milk cool and sweet. In this pleasant and picturesque valley, and under the shade of the trees surrounding the spring, with a liberal supply of good, cold sweet milk furnished by our host, Mr. Turley, we ate a bountiful and luxurious picnic dinner. After the wreck had been cleared, President Furnas, by request, repeated his lecture on his trip to California, which was much enjoyed. Some routine business was attended to. A vote of thanks was passed, thanking the local Society for its generosity and efforts to make our visit pleasant and profitable. The railroad was also thanked for their concession in rates.

The meeting then adjourned *sine die*

The next day quite a number of horticulturists made an excursion to the celebrated French Lick and West Baden Springs, where the day was very pleasantly spent. These springs have become one of the features of the State. In certain diseases these waters have proven remarkably curative. At the height of the season this year the attendance ran up to 700 and 800 at each place.

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# STATE FAIR MEETING.

On Wednesday evening, September 25, most of the horticulturists attending the fair met in the lecture room of the State Board of Agriculture and held an informal meeting, Vice President J. C. Stevens in the chair.

*Secretary.* It will be well for this meeting to decide whether we offer premiums on fruit at our annual meeting, in December.

*S. Johnson.* I move that we offer premiums at our annual meeting.

The motion carried.

*Prof. Troop.* I would like to ask about the new peach, the Patterson, shown by Albertson & Hobbs at the fair.

*Mr. Henby.* It is a seedling growing in Mr. Patterson's yard at Greenfield. It is a very fine peach for a cling. I think it worthy of introduction. The tree is young and has not stood any of our test winters. Can't say whether it will prove hardier than common varieties.

*Secretary.* The peach is large, of excellent quality and beautiful color.

*J. C. Stevens.* Daniel Bulla exhibited some very fine seedling peaches at one of our meetings this fall.

Some one inquired about the Robinson plum.

*W. A. Workman.* The Robinson rotted some with me this year, and the late frost damaged them so that the crop about Greencastle was light. There is not much demand in the market for red plums when they can get blue.

*Prof. Troop.* Robinson rotted this year; bore full last year.

*J. C. Stevens.* I have fifteen varieties of plums. The Robinson bore full and the others failed.

*Secretary.* Where the European plums and their descendants can be successfully grown there will not be much, if any, demand for native plums, they are so much superior in size and quality. The native plums can be grown anywhere in the

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United States. This can not be said of the European varieties. There has been a great improvement in native varieties recently.

*Prof. Troop.* How about the Mariana plum? It seems to be a fine grower.

*Secretary.* Young trees do not seem to bear very freely.

*W. A. Workman.* The Robinson is a good fertilizer for other varieties.

*Mr. Carmichael.* The Robinson bears abundantly, but I prefer the Damson and Wild Goose.

*Mr. Henby.* Lombard does well, bears young and abundantly, and is not troubled much with rot. Robinson is, I think, more of a sloe than a plum.

*Mr. Carmichael.* Plums are sometimes killed by late frosts.

*Mr. Henby.* Moor's Arctic is fruiting in Greenfield. It promises well.

*Secretary.* The Moor's Arctic seems to be doing well wherever fruited in the State. Trees seem to be perfectly hardy, and are early and abundant bearers.

*Mr. Workman.* In regard to varieties of peaches reproducing themselves from seed, I can say some will do it, as I have tested the matter.

*S. Johnson.* They will sometimes reproduce themselves from seed.

*Secretary.* In Washington County, this State, there is a large seedling late cling peach resembling the Heath cling. It originated in that county, and is known as the Fleenor Cling. It is grown from the seed chiefly, and I never knew but it invariably produced the same.

*Mr. Carmichael.* If you want to grow peaches in this latitude it is best to grow them from the seed, as they endure our cold winters better.

*S. Johnson.* Inquires about the Russian apricots.

*Mr. Henby.* I have not seen or heard of their fruiting in the State. I think them of little value here.

*Mr. Workman.* Says he has not fruited them or seen them fruiting.

*Mr. Shera.* I know of an Alexander that has fruited the past ten years.

*Mr. Henby.* They have not been introduced in the State that long.



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*Mr. Shera.* I have a gentleman's word for this.

*Mr. Stevens.* I have them from Prof. Budd, but they have not fruited yet.

*Prof. Troop.* They seem to bloom, but do not fruit.

*S. Johnson.* We have present with us the originator and introducer of the Gregg raspberry, Mr. Gregg; we would be pleased to hear from him.

*Mr. Gregg.* I discovered and introduced the Gregg to public notice. I am glad to know that it has proven to be so successful and popular. In the summer of 1868 I found one bunch growing in the woods. It was full of fruit and attracted my attention. It was removed to my garden and propagated. The original planting is still standing. I sent fruit to the Hamilton County, Ohio, Horticultural Society. They named it Gregg. In the summer of 1876 we sent to the Centennial large clusters of the Gregg. It received the highest award.

*S. Johnson.* I would like to raise the question as to whether the berry business is not overdone. This season I sold good black raspberries at $1.70 per twenty-four crate. That is too low a price, and very discouraging to the grower. The high price of sugar has decreased the demand for berries this year, I think.

*Jesse Stevens.* I can't speak for Indianapolis market. Some years ago there was profit in growing berries in central Indiana. Now there are so many growers that it cuts prices. Some of the smaller growers are going out. We must raise better berries and get them to market in better condition. More fruits are being consumed each year.

*Mr. Gregg.* We should encourage planting for home use. There is no question that prices are lower and profits smaller than formerly.

*Prof. Troop.* The fruit market is much like the butter market. Cheap butter will sell cheap; good butter will sell for a good price.

*Mr. Henby.* If I can sell my berries myself I can realize a good profit. I can sell in the local market at $3 per bushel. But when we ship and pay express and commission, it often reduces the profits to nothing. We need a better system of handling and distributing our fruits and better shipping rates. I am not discouraged with fruit growing.

*R. M. Lockhart, Waterloo.* I am not a member of a horticul-

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tural society. I don't know of a local horticultural society north of the Wabash. I am interested in the berry business. We get fair prices. Michigan berries sell in our markets at eight cents when the home-grown sell at ten cents. We can't ship by express; it is too expensive. We have the finest apple region in the country. We are going into apples and pears more largely. Years ago we planted too many varieties for profit; we are now planting more largely of standard sorts. They are more profitable to plant; can be gathered and sold more easily. I think we will soon organize a local society. We will invite you to hold a summer meeting with us, see our fine country and fruits, and ride on our beautiful lakes.

*Secretary.* We shall only be too happy to receive such an invitation.

*Mr. Henby.* I am glad to say that our local society is doing good work. We have brought to notice a valuable grape, peach and pear that originated in our county, and think we shall have a strawberry this season.

Adjourned.

## NOTES ON FRUIT CULTURE.

BY JACOB D. HAMPTON.

CHESTER, IND., December 2, 1889.

*Respected Members of the State Horticultural Society:*

An extra press of business at home deprives me of meeting with you this year, but I should like to say a few words on "Orchards," when that topic is before the house, for who is there among you that would not rather welcome the fruit-grower at your dwelling with a basket of nice ripe fruit than a doctor with nauseating drugs?

Such being the case, let us consider for a moment the cause of the failure in fruit crops the last few years.

Especially is this true with those who do not make it a business to grow fruit for market.

In discussing this subject, I shall as briefly as possible present some of the difficulties in fruit raising, and suggest some remedies for them, hoping to get the subject before the Society for an abler and more satisfactory discussion.

We certainly can not consider a subject more worthy of our attention, or that better results will follow a careful examination.

The most farmers are poorly supplied with the best varieties of fruit; neither

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are their orchards in a healthy condition. The location is often badly chosen, and their cultivation sadly neglected. If the farmers were to neglect their crops as some do their orchards, the road would be short to bankruptcy.

The fruit trees that were planted in the early history of this heavily timbered country were almost universally productive. They were healthy in their virgin soil, having the advantage of being sheltered by the forests, which somewhat modified the climate and prevented to some extent the extremes that are now upon us.

There is a disposition on the part of some to expect their orchards to take care of themselves, as they did when the soil was fresh and full of vitality, forgetting that every other product requires double the care and cultivation that it did when the country was new.

The orchards of this State are capable of producing four millions of bushels of apples suitable for market, which, at fifty cents per bushel, would amount to the handsome sum of two millions of dollars, and when they fail, that amount is paid to other States for fruit for our consumption. We ought to produce enough apples, pears and small fruits to supply our own markets. In passing through the country we are surprised to see so few good orchards, when we consider how much money is paid out for fruit trees planted annually.

The tree-grower may sometimes fall short of the best varieties of apples to plant in an orchard for profit, and so he takes what he has on hand, with some fair promises and speeches from the nurseryman that they are just as good as you will get anywhere, and when he yields to his entreaties he has made a sad mistake that can not be easily remedied.

My judgment in selecting trees for planting is two or three year old trees, smooth and well grown, and that have been carefully pruned so they will show but few scars and that are clear of forks. We have suffered much from a certain class of tree venders who sell from nurseries far away, and the trees prove to be worthless. Obtain your trees from some reliable nurseryman in whom you have confidence, for he will not be likely to sell himself for a few paltry dollars.

While there are some serious natural difficulties in the way of successful fruit growing in our soil and climate, I am convinced that the greatest is with the grower.

There is too great a lack of horticultural knowledge among the farmers. They are not as well posted in horticulture as fruit growing in our climate requires. Go slow on new and untried varieties, and don't be carried away with fine speeches. It certainly would be to the advantage of every fruit grower to attend our county and State societies, or carefully read their reports, and by other means get a practical knowledge of fruit growing. Those who make fruit growing a success, succeed by intelligent industry.

The location is important. Too often we see trees planted in cold, damp soil, with imperfect drainage. We think the highest and dryest soil the most suitable, and if there be a valley or swale twenty-five or fifty feet deep within twenty or fifty rods of it, running along the north or east side, so the chilling frosts of zero, which are so destructive to our orchards, may find a lodging place as they are carried by the southwest winds in that direction, so much the better. If the soil is not well drained, drain it; if it has been impoverished, enrich it. "From nothing comes nothing," is as true in fruit growing as in our philosophy.

In preparing for planting, plow in the fall, leaving the cleaning-out furrow where the trees will stand. This gives an opportunity for the frost to operate on the sub-soil, thereby making it mellow and in a better condition for the trees, as well as draining the ground on which they are to be planted. In the spring, re-

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plow, reversing your furrows. Plow and harrow until it is in good condition for planting, with the ground several inches higher where the trees are to be planted, which will relieve them of surplus water in time of heavy rains and give a mellow soil to grow in.

It is essential that we plant new orchards every ten or fifteen years to secure fruit perpetually. By thus planting we keep up with the declining varieties and are able to discern between the barren and fruitful trees.

Plant your thriftiest varieties on the thinnest soil and the slowest growers on the richest, and both will be better for it.

A hundred trees will occupy two and a half acres of ground if set two rods apart. It is better that the ground be a square than twice as long as wide, from the fact that it gives less territory for destructive insects.

There are 33,809 square miles in this State, which, after deducting 16 per cent. for towns, cities, roads and rivers, leaves us 25,357 square miles, and multiplied by four gives us 101,428 quarter sections; these multiplied by two gives us 202,856 eighty-acre lots. If one acre of the eighty-acre lots be planted in fruit trees, we will have 8,144,240 trees, and if they produce two bushels each, will give us 16,228,480 bushels of fruit, and if sold at 25 cents per bushel gives us the sum of $81,142,400.

There are 500,000 trees needed for planting every year to keep up this demand, so you see there is business for the reliable nurseryman.

If you have thirty trees, properly planted and well cared for, that are good bearing varieties and that will suit the market in which they are to be sold, with proper care, culture and training you will not often be without fruit that will be a satisfactory reward for your labor. Such as we sow, such shall we reap.

Respectfully,

JACOB D. HAMPTON.

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## *NOTES ON FORESTRY.

BY R. H. WARDER, PRESIDENT OHIO FORESTRY ASSOCIATION.

I suggest for the discussion the general subject of tree planting in order to replace, in some small degree, the terrible destruction of trees which has been going on in the timbered parts of the United States since the settlement of the country by the white race. Of the necessity of keeping a certain portion of the earth's surface in trees, there is now no longer any question. True economy demands it for health and for climate, as well as for minor reasons. I do not pretend that the fertile fields of Indiana should be allowed to grow up to woodland, as the trees flourished years ago, but there is hardly any farm, or home, on which some dozens, or some hundreds, or some thousands of trees might not be planted to the ultimate profit of the owner.

The trees may be planted as wind-breaks and screens only, or as small or large plantations set out like orchards, or for shade along road-sides, or in pastures, or for mere gratification of the sense of the beautiful; waste-grounds, and unsightly places may be planted to advantage; steep hillsides covered with useful trees; and

*Prof. Warder was prevented from being with us on account of the death of a friend. He sends these brief notes on forestry to call attention to its importance.—SECRETARY.

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above all, the head-waters of our rivers, including the tiniest springs and branches all over the State, should be protected by trees, and the subsequent water-flow made more constant. The diffusion of certain knowledge about the mechanical part of planting, and the kind of trees adapted to the place, soil and climate, is to be advocated. The proper observance of Arbor Day as a State holiday, with appropriate instruction to those present, may be made the means of directing thought and subsequent action in the right direction.

And above all, try to get the people to realize the peril of the present time. In a few years it will be too late to do anything with existing forests, for there will be none. Now is the time to act. You horticulturists know how useless it is to plant an orchard and then neglect it. Just so young timber will not do well without some care. The young plantation must not be pastured to death, nor can it be cropped in wheat and potatoes, or strawberries and grapes.

Each region has certain kinds of trees which are native to it, and which will probably thrive better than some other sorts, though some experiments with foreign kinds are advisable. The different periodicals of the country, and the experiment stations' reports, and the experience of reliable nurserymen give useful information. Do not plant a poor tree if a good one can be had, but plant a good specimen of a good sort, and plant it well, either spring or fall, as you have found most suitable.

With best wishes for a successful meeting, and regrets that I can not join you,

Truly,

R. H. WARDER.

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## NUT CULTURE.

[Read by J. P. Applegate, editor of the *New Albany Ledger*, before the Floyd County Farmers' Institute, at Edwardsville, Nov. 23, 1889.]

The subject will be divided under four general heads: Where to plant, when to plant, how to plant, what to plant.

### WHERE TO PLANT.

Anywhere that room can be found to plant a tree. Nuts can be profitably grown along the northern side of the garden, if it is large enough, and all farm gardens should be large. Many, if not in fact all, nut trees are suitable for lawns.

The roadside is an appropriate place. The walnuts and hickories especially make admirable roadside and lane trees. Waste places may be made useful, as on most of them some kinds of nuts can be grown with less labor and money outlay than are required to otherwise make such places profitable. Hillsides can be utilized to grow English filberts, the sweet hard-shelled almond, and chestnuts. All these find their natural home on rugged steeps, and all are profitable, especially the filbert and chestnut.

The walnut wants fertile soil, the richer the better, so that its cultivation on a large scale necessitates the use of good land, and the question of comparisons of profits comes in.

The hickory and pecan will flourish on land too wet for corn, wheat and other cereals, but must not be planted where lands are too frequently overflowed, or where water stands too long, but they will stand a good deal of water. They are mostly found in the wild state along streams in rich alluvial bottoms, though like the sycamore, whose roots love water, they are sometimes found on dry, hilly land.

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### WHEN TO PLANT.

If transplanting trees, do the work whenever you are ready in spring or fall. If there is any difference it is, perhaps, in favor of spring, so far as certainty of life is concerned, but then the weather is generally so much better and the average farmer has so much more spare time in the fall, it is safer to advise fall planting, as the advice is then more likely to be followed.

Nuts may also be planted in spring or fall, though it is less trouble to plant the nuts in the fall as soon as gathered, and thus save winter care and handling. Trees planted in fall need a little more protection by mounds or mulching, and nuts planted in fall must be protected from squirrels and other rodents.

The time in fall or spring to plant nuts or trees of course depends upon the season and location. No iron-bound rule can be laid down on this point. March or April for spring, and September, October and first half of November for fall, will hit most seasons.

### HOW TO PLANT.

One great bug-bear in the way of nut-tree planting has been the idea that they could not be transplanted without great labor and risk. If men go to the woods and dig up trees several years old with long tap roots which must necessarily be cut off, the tree will die unless it has extra care. Nut trees from the nursery where they have been properly handled are no more difficult to grow than the peach, cherry or plum.

The cheapest, and probably the best way for the farmer to grow nut trees is to gather or buy nuts in the fall, being careful to get the best obtainable of each variety, put them in a rich bed of earth three to six inches apart, in rows twelve to eighteen inches apart, cover them about twice the depth of the diameter of the seed, and when the weather turns cold cover them two or three inches deeper with leaves, straw, rotted manure or other good mulching material. Remove the extra covering in the spring, cultivate carefully, and give some shade through the heat of summer; transplant in nursery rows in the fall; hill up the rows, give them strawy manure or other mulching through the winter, cultivate the next summer and plant in the fall where wanted, observing the precautions usually followed in fall planting, and success will follow as often as it does with any other tree planting. The farmer who does not want to take this time and trouble can secure all kinds of nut trees adapted to this climate from reliable nurserymen in various parts of the country at reasonable rates.

Walnut, hickory and pecan trees have been successfully budded and grafted.

The oftener young trees are transplanted the more fibrous roots they have. "The pecan tree transplants about as readily and safely when one or two years old as any other tree, and older trees, when root pruned or transplanted every two years, will live and do well with a little care in transplanting," says D. B. Weir.

The after cultivation of nut trees is substantially the same as for any other orchard trees.

The distance apart to plant depends upon the kind, the location, the soil and the purposes for which they are grown. For nuts, the walnut, hickory, chestnut and pecan should be given about the same space as the apple, thirty-six to forty-two feet. Some advise planting peach and nut trees alternately, as the peach trees will be beyond their prime before the nuts will need the room. Almonds and filberts should be planted from twelve to fifteen feet apart. If planted for timber as well as nuts, the trees should be five to eight feet and rows eight to twelve feet apart.

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Nut trees are usually of slow growth at the start, but increase in geometrical ratio with age and good cultivation. A loose soil is especially craved by the walnut and pecan. When the seeds of these trees first found lodgement in Southern Indiana their roots penetrated the undisturbed mould of centuries; they struck deep, and the giants that once reared their heads on our hills and in our valleys, now, alas, all laid low, were monarchs of their kind. With proper fertilizers and cultivation, our children, if not ourselves, may witness a new growth of these mighty trees that our forefathers and the older of ourselves so ruthlessly felled.

Fertilizers increase the size of tree and nut, and also bring them into bearing earlier.

In planting nut trees the same rule should be followed that the best orchardists now follow, of planting several trees of the same species near enough for the proper action of the pollen.

Experiment has shown that nuts slightly dry, especially chestnuts, will sprout, so that nuts may be bought in the market, if fresh, and grown with but little loss.

### WHAT TO PLANT.

All kinds of nut trees are profitable in their natural habitat, and some may prove so out of their native home. The hickory grows everywhere in the middle West, and would be profitable for waste places and road-side planting, if every tree was barren. The shellbark hickory comes into bearing in about ten years, and is worth more in the market than the average peach, pear or almost any other fruit.

Of the value of walnut timber all are aware. Timber men figure that it would be a good investment to buy lands suitable for walnut trees, at anything under $25 per acre and raise nothing else on it but walnut timber. But the nuts will outsell apples, and when properly managed produce abundantly. The age at bearing depends largely on the kind and treatment. Of course trees grown close for timber will not produce like those planted for orchards, and the grower must elect whether he will grow for nut or trees, or combine the two.

England imports 150,000 bushels of walnuts from the Continent annually, and would take a good many more were an effort made to ship them regularly from this country.

English walnuts would do well in Southern Indiana, if the hardier varieties were planted and a little attention given while small. They have been successfully grown in New York. Trees planted in Bergen County, New Jersey, in 1851, have borne every year since 1864. When we consider the number of bushels of English walnuts imported every year and their value, an estimate may be made of the profits to be realized by their cultivation here.

The English filbert will also grow and bear here or wherever peaches do well. They come into bearing early, and occupy comparatively little space.

Of the American chestnut we all know something. But we do not know of the profits awaiting those who plant the improved varieties and take care of the trees as we do our orchards. It has been demonstrated that Japan chestnuts will bear in New York and New Jersey and that the tree is hardy here. The advantage in growing them is to be found in the fact that they come into bearing as early as the peach; the trees are smaller than the native chestnut and the nuts much larger and command a higher price. All chestnuts, by transplanting and cultivation, come into bearing early. Prof. Satterlee says he has young trees growing that are the grandchildren of nuts planted twenty years ago. Prof. Budd tells of a row of chestnut trees in Benton County, Iowa, started from nuts planted eleven years prior

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to 1886, the trees at that date being six to eight inches in diameter, twenty five to thirty-five feet high; some of them bore at seven years; at nine they bore fair crops, and that in size of tree they compared well with ash, elm and butternut planted at the same time. Chestnuts, as heretofore said, make beautiful lawn, roadside and orchard trees.

All things considered, I believe pecan trees would pay better in the long run than any nut or fruit tree that can be grown in southern Indiana. Of course the best hardy varieties should be selected. To grow them from the nut to bearing trees would require about the same time as the Bartlett pear from seed, say ten to twelve years. A tree on the Knobs, near New Albany, fourteen years from the seed, bore a peck of nuts this season. That is a long time, but for five years of the time almost any crop can be grown in the pecan orchard and many crops can be profitably grown until the trees come into bearing, so that the time does not run against the profit of the future crops. They last for a lifetime—even three or four—counting thirty-three years as a generation. Originally they were found growing in various parts of this State, Ohio, Illinois and Missouri, and are now growing wild in the latter States and along the Wabash river in this State. Pecans will grow wherever the ordinary hickories and oaks flourish. In California and Texas they have borne crops at seven years. By good culture they will bear in this section at ten years from the seed.

There are many varieties, and some bear much earlier than others. As to their hardiness, the pecan has been grown in New York and Iowa. There are large trees near Niagara Falls. Sixty miles north of Peoria, Illinois, D. B. Weir says there are large bearing trees. He also says pecan trees have stood 36 degrees below zero in Illinois. Professor Budd says the pecan is hardy in Iowa, beyond the northern limit of the Ben Davis apple. Mr. Moon, of Bucks County, Pennsylvania, commenced raising pecans 35 years ago, and finds it very profitable. A Texas grower says that at fifteen years, his pecan trees averaged $15 to the tree. An orchard of a hundred trees would afford a nice income. On the gulf coast growers have dug up and thrown away orange trees to plant pecan trees. Nearly all the large nurseries are prepared to fill orders for pecan trees.

Nut growing is safe from over-production for many years to come. People are slow to take up anything out of the regular routine, and those who first embark in nut culture will have a long series of years with but little competition. That is an important item to consider.

In a visit to the plum orchard of Mr. J. B. Johnson, at Greencastle, he said he had advised a young man, about to plant ten acres in fruit, to put five acres in nuts. Said he, the grower has all the fall to gather his nuts, and all the year to market them. Think of that, you strawberry and raspberry growers, who must get your fruit to market the day it is ripe or lose it. And the same can be said of the peach and plum grower. A whole year, and the whole country for a market for nuts!

The risks of frosts and drouths and insects and other drawbacks attend nut culture, as they do everything else that grows. The weevil infests the hickory, chestnut, pecan and even the filbert; the mistletoe kills the walnut trees if not fought. Yet none of them are worse, or even as bad, as the curculio on plum and peach; the codling moth on apples; the cut worm and crown borer on strawberries, and the saw fly and other insects on raspberries. In the sweat of the face, must we gather nuts as well as fruits.

Nut trees aid in keeping the boys on the farm. It would be a good plan with that end in view, in many cases, to put the nut culture into the hands of the boys. It would be a present delight and something definite for them to look forward to.

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The future value of nut trees, if the farm is put on the market, should be considered. Take the average one-hundred-acre farm in this township, put the price at $50 per acre, equal, $5,000. Plant nut trees properly selected every other rod around that farm, which can be done by planting nuts at an expense of $5, or less, or with one-year-old trees at a cost of $20 or $25. How much would those trees add to the appearance and selling value of that farm at the end of twenty years?

There is still another and higher view to take of the matter. It is our duty to plant trees. We owe it to the children we will leave behind. Already the denuding of our lands is being severely felt in many parts of our country. It is only history repeating itself. Go view "the country 'round about Jerusalem." That land, where once was rich verdure, is a barren waste; where once the eye was pleased with the green of the trees, and the palate tickled with luscious fruits, is now bleak sands and mossless stones. Italy, Spain, France, all teach the lesson. By a liberal system of forest restoration France is repairing the ravages of former neglect, but in Spain, valleys and hillsides that once blossomed with the grape and the olive, whence came the wine and oil of commerce, now are treeless, vineless waste places, affording only sheds to hurl destructive floods on valleys yet fruitful. We must heed these lessons. We must plant trees, and encourage others to plant, that we may save our fair land as a fruitful heritage for succeeding generations.

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## THE SANITARY INFLUENCE OF TREES.

For the last few years public attention has been quite frequently called to the influence of trees upon climate. The special issue of the United States Agricultural Department on Forestry, and many other contributions, have shown how rainfall is affected, how the balance of the atmosphere is disturbed, and how climate changes from the extended and rapid removal of forests.

There is another study of trees allied to this which has reference to their relation to houses and to individual health.

Both the atmosphere and the soil are cooled and moistened by the presence of trees. This results from the drawing up of the water from the subsoil and from the exclusion of the sun's rays. Besides this a considerable portion of the rainfall collects on the leaves and branches. M. Fantiat has shown "that the leafage of leaf-bearing trees intercepts one-third, and that of pine trees one-half of the rainfall, which is afterward returned to the atmosphere by evaporation. On the other hand, these same leaves and branches restrain the evaporation of the water which reaches the ground. This evaporation is nearly four times less under a mass of foliage in a forest and two and one-third times under a mass of pines, than in the open." Then we have stagnation of air from that interruption of wind currents caused by the foliage. It is, therefore, not without reason that the sanitarian studies the trees of the yard or lawn in their bearing upon individual health. Persons of susceptible lungs or having any tendency to rheumatism need to be carefully guarded against such influences. Where the foliage is dense about houses, or where the limbs overshadow the piazzas or roof, they become the storage places for damp, unwholesome air. The falling leaves, gathering from year to year, give a corresponding dampness to the soil, while at time of foliage the sunshine is measurably excluded. It is pretty evident that mankind was not intended to be reared in the woods. The influence of trees in causing malaria, or in so intercepting it as to have it tarry among them, has long been known. "A dry garden on gravel,

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of three acres in extent, in Surrey, surrounded by trees, is generally three to six degrees colder than the open common beyond the trees; and a large pond in a pine wood twenty miles from London afforded skating for ninety consecutive days in the winter of 1885–6, while during the greater part of the time the lakes in the London parks were free from ice."

We know with what interest the lover of trees watches the growth of those planted by his own hand, and how many are apt to be scattered about the new home mansion. As years go on, and their growth and foliage increase, the owner is loth to remove them or severely to shorten their branches. If so, there is great danger that the dry soil and once comfortable home will come to be the dampest and least desirable spot in the neighborhood. A recent careful writer has given the following sensible direction as to tree planting as it bears upon the conditions of health: "A tree should not stand so near a house, that if it were to fall it would fall upon the house; or, in other words, the trunk should be as far from the house as the height of the tree. Belts of trees may be planted on the north and east aspects of houses, but on the east side the trees should not be so near, nor so high as to keep the morning sun from the bedroom windows in the shorter days of the year. On the south and west aspects of houses, isolated trees only should be permitted, so that there may be free access of the sunshine and of the west winds to the house and grounds. High walls and palings on these aspects are also objectionable and should be replaced by fences, or, better still, by open palings, especially if the houses are occupied during the fall of the leaf and in the winter. Trees for planting should be chosen in the following order: conifers, birch, acacia, beech, oak, elm, lime and poplar. For our American homes we must add the maple, the ash, and the tulip tree, or American poplar, although the dense foliage of the maple is sometimes objectionable. Pine trees collect the greatest amount of rainfall and permit the freest evaporation from the ground, while their branchless stems offer the least degree of resistance to the lateral circulation of the air. Acacias, oaks and birches are late to burst into leaf, and therefore allow the ground to be warmed by the sun's rays in the early spring. The elm, lime and chestnut are the least desirable kind of trees to plant near houses. They come into leaf early and cast their leaves early so that they exclude the spring sun and do not afford much shade in the hot autumn months when it is often required. Trees are of value in indicating choice of residence. Rich foliage, fern and mosses tell of dampness and alluvial deposits. Flowers and fruiting trees point to a dry and sunny site. Children will be healthiest where most flowers grow, and old people will live longest where our common fruits ripen best. Pines and their companions, the birches, indicate a sandy or gravel soil, elms a rich and somewhat damp soil, oaks and ashes a heavy clay, poplars and willows a low, damp or marshy soil. Let then our aesthetics be tempered by our desires for health, and choice and abundance of trees to be adapted to our sanitary needs."

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## COLD STORAGE ROOM—THE PRINCIPLES INVOLVED AND THE PLAN OF CONSTRUCTION.

The cold storage system is gradually growing into favor as its practicability becomes known. Where a constant low and dry temperature can be maintained, the principle is no longer a secret. Nor is it necessary that the room be made of any particular size or form. It must, however, be thoroughly insulated in regard to keeping the walls impervious to circulating currents of air, except those neces-

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sary for ventilation, which should be small and perfectly controllable. A plan of a very good room is given by the *California Fruit Grower*, as follows: Erect a frame, lined upon the inside with heavy paper and varnished with shellac, then ceiled and floored with tongue and groved material five-eighths or three-quarters of an inch thick. Varnish the entire inner surface. Before putting down the paper lining and floor, fill in between the framing dry sawdust and pulverized charcoal mixed. Board up the outside with tightly matched boards, filling in as you board up with the sawdust and charcoal, as well as every part of the top, excepting the door for putting in the ice.

THE DOOR FOR ENTRANCE

to the room must be made to shut against broad jams and angular closures like an iron safe, so that it can not stick by swelling. It should be made by framing and packing with sawdust and charcoal, in the same manner as the room, which should be from twelve to fifteen inches between the walls. Frame an opening in the ceiling large enough to let in a galvanized sheet-iron box of sufficient size to hold as much ice as you may wish to store, or about one-tenth of the capacity of the whole room. The ice chamber should be fitted into the opening tight, with a flange all around the top. It may be made of No. 18 or 20 galvanized sheet-iron. To the bottom attach a coil of galvanized iron or lead pipe, running two or three times around the room, hanging on hooks or brackets, just below the level of the ice box. Pass the end of the coil through to the outside of the room and terminate in an inverted siphon, so as to retain the water within the coil up to a level just below the bottom of the ice box. This is for the purpose of

ECONOMIZING THE COLD

from the waste waster by circulating it around the room. From the cross beams of the ceiling, as bearings for the weight of the ice, place two or three straps of square iron, of a size sufficient for carrying the weight of the ice you intend to put in. Let them hang upon the inside of the galvanized iron box to within an inch of the bottom. Upon these straps lay a hardwood grating. Make a galvanized iron cover to fit tightly over the ice chamber, and a wooden one to close over the iron one. To prevent the water, which may be condensed upon the outside of the ice chamber, from dripping down upon the goods, make the bottom of the ice chamber bulge downward, so that the condensed drops will run to the center or one side, where a small pan may be hung with a small pipe leading to the outside of the cold room, and a siphon attached, to prevent ingress of air. The ice chamber may now be charged to its full capacity with ice, and if a very cold room is required sprinkle a layer of salt between each layer of ice. This is seldom used for such rooms.

THE PRINCIPLE EMPLOYED.

The principle on which this cold room is constructed is that there shall be no communication between the ice with its moist vapor and the air of the cold room. Any moisture made by cooling of the air, and which is precipitated upon the iron surface of the ice chamber, is at once conveyed out of the room by the drip-pan and its pipe. Hence there is no need of any special ventilation, more than what will naturally occur by the use of the door and the small leakage through its crevices. The ice chamber requires no ventilation, hence economizes the ice to the best advantage, while the water from the melting ice is turned to the best account by circulating around the room in the waste pipe. The best temperature for eggs and fruit is about 34 degrees or any temperature below 40 degrees, and above freezing, where this kind of stock is often changing by sale. If stock is to lie for considerable time, 34 degrees should be obtained if possible.

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# A BIG BERRY BUSINESS.

AN INTERESTING THOUGH LITTLE KNOWN HOOSIER INDUSTRY—THE GROWTH OF THE CULTIVATION OF SMALL FRUITS AND BERRIES IN INDIANA—THE KNOBS PARTICULARLY AVAILABLE—THE PECUNIARY RESULTS.

[Correspondence of The Indianapolis News.]

JEFFERSONVILLE, June 26.

The culture of small fruits and berries, which has taken a strong foothold in Southern Indiana, ten years ago was hardly thought of, only here and there some adventurous farmer having a small berry patch. Now there is a great fruit belt, extending through the counties of Jefferson, Clark, Floyd, Washington, Scott and Jackson, and sending out hundreds of thousands of crates filled with strawberries, cherries, raspberries, peaches, blackberries, apples, pears, plums, currants, grapes, and, last, persimmons, every season.

The official statistics of the State of Indiana give hardly any idea of the extent of fruit culture in this section, yet there are thousands of people engaged in this form of industry every summer.

New Providence, Clark County, alone ships between 30,000 and 40,000 crates, Memphis near 30,000, Henryville 30,000, Sellersburg 5,000, Farrabee's 10,000, Otto 100,000 to 200,000, Madison 200,000, New Albany 200,000, of all kinds of fruits. The product will be nearly doubled next year if the season is good, as many new orchards and berry gardens will be set out the coming season, the people having at last discovered that the apparently worthless holly lands pay better in fruit than the richest bottoms in cereals.

The reader must not suppose that the entire section is given up to fruit culture. One may travel great distances over any of the counties mentioned and not see either a real orchard or a berry garden. Both are confined to the uplands and hills of the knobs and bluffs, for berries, like peaches, grow best up there. A berry garden is not only very profitable, but during bloom and fruit offers a very pretty scene. In the berry region there is hardly a farmer who has not at least a patch, while many devote their entire attention to fruit of various kinds, and cherry, plum, apple, pear and even persimmon orchards may be found.

In Ward Township, Clark County, with New Providence for its shipping center, there are nearly 200 acres in berry cultivation, which is about equaled by at least three other townships in the county, making 800 acres in berries alone in this county, while some of the adjoining counties, notably Floyd, must nearly double this.

Those who have never tried to raise straw, rasp or blackberries may think that a berry patch of nine acres is a very small concern. So it is, till you come to tend it and pick it. Generally the patches do not exceed ten acres, while the majority are only from three to six acres. But small fraction of a farm as such a patch occupies, it pays better than ten times the same acreage on the best bottom land. Red raspberries will bring a return of $100 to $112 per acre, black raspberries from $100 to $125 and blackberries $100, while strawberries will yield $50 to $100 per acre. The culture of the latter berry is mostly confined to Floyd and Jefferson Counties.

About a week ago I made a trip through the romantic Silver Hill Range of Clark County, visiting especially the raspberry gardens, and ending my trip at the lovely little town of New Providence, nestling in the valley on a fork of Silver Creek. If Indiana offers a fairer sight anywhere else, I have not discovered it. It

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reminds one very much of the celebrated Lehigh Valley of Eastern Pennsylvania. Rich bottom lands and willow-fringed creeks, comfortable farm houses hidden in orchards, stretch away to the south. On both sides rise the forest clad hills, with here and there a tall cliff rising bare and gray and abrupt from the valley. Narrow glens sidle off to east and west, hiding the roads under their leafy shelter. If you follow one of those roads it is almost certain to lead you to the top of the hills and to a berry farm. It may be rather weary to climb up 500 feet above the valley, but the beauty of the hills, the purity of the air, the wide view, will amply repay it, and at the top the hospitable farmer will press upon you berries and cream so fresh and luscious that it will be a revelation.

Let us follow the farmer. He has one of the largest berry patches in the section, and we can learn here how the business is carried on. It is yet early, the sun has not yet dried away the dew, which hangs pearly upon the bushes. There are about thirty acres of uneven ground in sight, dotted here and there with small shanties surrounded by plows, hoes and various other implements needed for the cultivation of the farm. Some fifty or seventy-five children, men and women stand around the shanties, laughing, chatting and waiting till the owner shall give the word for the picking to begin, which is as soon as the sun shall have dried the dew, for berries can not be shipped while wet; they would sour. As soon as the word is given each picker seizes a small wooden basket, just large enough for four one-quart boxes to be placed in it side by side. All being ready, a race begins to see who will bring the first gallon of berries to the shanty. Each one runs to his or her row, and with all the activity that can be put forth, begins to gather the fruit. In thirty or forty minutes some one will start for the house with a gallon of berries, having gained the race by only a few moments. Presently you see another, and still another, filing toward the shanty with full baskets. On reaching the place the nimble-fingered berry picker presents his basket of berries to a clerk, and in return receives a check for the quantity picked. Thus they come and go all day as swiftly as feet and hands will let them, stopping only for a brief dinner. This work is repeated every day while the season lasts, and every Saturday the checks are exchanged for cash, each representing a gallon or seven cents in money. The quantity picked per person varies from ten to eighteen gallons per day. On some berry farms the price is lower than that given above, a few paying as low as four cents a gallon for picking. The shipper receives thirty to fifty cents per gallon for his fruit.

During the hight of the season an almost continuous line of wagons wends its way from the hills to the various shipping points, where express cars stand on sidings ready to be loaded and to put down the fruit, which is shipped here at 8 p. m., at Indianapolis the same night, and at Chicago at 5 o'clock the next morning. The railroads appear to be fully awake to the importance of the fruit business, and give every facility to the berry and orchard men. Work on a berry farm is very simple. The plants are either put out in rows or in hills, five to six feet apart, and cultivated a good deal like corn. The prevailing mode of planting is in continuous rows. Berries bear the first year, certainly the second, and therefore give much quicker returns than peaches, being also a surer crop than these, but peaches are always in demand, while berries in some seasons become a drug in the market.

In spring the plants are trimmed, all the dead wood taken out, and the sprouts removed, either to be thrown away or used for new plantations. After the bushes bloom every new shoot is pinched out at the top, much like grapes, to prevent too luxurious a growth and to turn the sap to the fruit, which clusters in great bunches at the top, breast high. This is about all the care, aside from picking,

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which the bushes need or receive. Blackberries grow much more luxuriantly than raspberries, and, therefore, are harder to hold in check, but they pay better, and are in better demand, as they can be used for an endless variety of purposes, even the spoiled fruit being available for brandies, cordials, etc.

There are about two varieties of raspberries and about six of blackberries cultivated. Currants are just beginning to make their way into favor in the lower valleys. An idea of the rapid growth of this form of horticulture may be gathered from the fact that one nurseryman near New Providence sold 200,000 plants this year, three fourths of them in Clark County, while he expects to double his sale during the coming season. It is the general belief that the average will be doubled during the year in this entire fruit belt, and many persons in the cities are investing money in buying land likely to be used for fruit.

A rough estimate made by myself gives an acreage of about 4,400 acres in berries in the counties of Clark, Floyd, Washington, Scott, Jackson and Jefferson, and if, as the fruit growers aver, this is doubled, next year will see near 10,000 acres in the luscious globules, or instead of a shipment of 350,000 cases there will be 700,000 cases of berries shipped, which, averaging $1.50 a case, would bring $1,050,000 to this section. HERMAN RAVE.

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## NOTES ON SMALL FRUITS AND POTATOES.

GRANVILLE COWING, MUNCIE, IND.

### STRAWBERRIES.

The strawberry crop in this region was much better than an average one this season, but the weather was excessively moist when it ripened, and it was marketed under very unfavorable circumstances. All varieties produced unusually large berries—Crescent, in size, equaling Cumberland grown in an ordinary season. Of new varieties, I had none as large, handsome and productive as Bubach and Logan. The berries of the latter do not average quite as large as Bubach, but many of them are as large, shapely and handsome as those of any variety, and are of excellent flavor. In size and beauty the berries of Jersey Queen stood next to Bubach and Logan, but in production it is far surpassed by them. All three are strong growers and free from blight. Jessie was not sufficiently productive on my soil, but did well only two miles away. But few of its berries were above medium size, and Crescent produced forty fold more fruit. Warfield also disappointed me, as its berries did not average as large as those of the Crescent, nor was it remarkably productive. Its berries are firm, but not of the best flavor. It is a strong grower, and made better matted rows than any other variety on my grounds, and I notice many favorable reports from all parts of the country concerning its fruiting this season. I liked Haverland much better. It is productive and its fruit smooth, sweet and shapely, but possibly not firm enough for long shipment. The berries of Haverland and Pearl closely resemble each other, but in other respects the two varieties greatly differ—Pearl inclining to blight, while Haverland is remarkable for health and vigor.

Gandy is a late variety of the Glendale type. Berries firm, late, tart and occasionally above medium size. As a late variety it did not seem as desirable as Kentucky, which appeared to have renewed its youth this season. Mammoth rusted badly and produced but few berries. The berries of Gold were large, handsome and of the best flavor, but not produced in sufficient abundance. Cloud is a strong

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grower but its berries are too small and soft to be desired. They averaged about half the size of the Crescents. Ohio again proved very unsatisfactory. It was represented as being like Kentucky, but much better. In every way except habit of growth it is much inferior. Cumberland blighted badly last year, but this season was in every way perfect. Jersey Queen was also superb. It requires the best treatment to induce it to exhibit all its good points. Plants of Eureka, Mrs. Cleveland and Ohio Centennial were sent to me by mail last spring by Mr. Townsend, their originator, to be tested. They are all strong, healthy growers, and a plant each of Ohio Centennial and Mrs. Cleveland, which were allowed to fruit, produced some very large and handsome berries. Two years ago William Lyons, of Minneapolis, sent me plants of a seedling which I fruited this year, and which promises to be valuable. It is a strong grower, free from blight, firm, productive and above medium size.

I have a seedling strawberry of my own which first fruited two years ago, and which, in delicious flavor and beauty, surpasses any variety I have yet seen. I have not yet had an opportunity of testing its productiveness, but hope to do so next year.

It is yet too soon to fairly determine the value of the most promising new strawberries, but thus far no variety generally planted has equaled Crescent as a profitable market berry, and it may still be safely planted while its rivals are on trial.

### RASPBERRIES.

The raspberry crop was in every way equal to any that ever preceeded it, and was sold at low prices. This season the public seemed to tire of this fruit before the season ended. The old favorites, Tyler, Ohio, Gregg, Turner and Cuthbert are still the best. Shaffer's Colossal is generally liked by those who grow it, but it has not yet been generally planted.

### BLACKBERRIES.

The blackberry crop was the best ever produced in this region. The preceding winter was so mild that the most tender varieties were uninjured, and seasonable rains while the fruit was maturing combined to produce a crop of large and perfect berries. Snyder was the most profitable and satisfactory variety. Taylor was in every way equal to it except that it ripened later, and therefore sold at lower prices. Stone, Agawam and Ancient Briton are good varieties, but on my soil are not as valuable as Snyder and Taylor. Wallace is probably the most delicious blackberry I ever fruited, but I have dropped it because it is not sufficiently productive. The cultivation and management of the Lucretia dewberry requires an unusual amount of labor and care, and on that account I do not believe that it will be extensively planted for market purposes, but it is the best of its kind, and worthy of a place in any garden.

### GOOSEBERRIES.

After looking for many years for a large gooseberry as productive and free from mildew as Houghton, I have, I believe, found it in Champion, a new variety from the Pacific coast. It is a strong grower, very productive and seems perfectly free from mildew. Its berries are large, smooth and handsome, and green when ripe.

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### GRAPES.

The grape crop was almost a failure in consequence of a late frost in May. Of black grapes, Concord and Worden are most generally grown. Martha is the only white grape grown to any considerable extent in this region. It has done better on my soil than Empire State or Niagara.

### POTATOES.

On well-drained land the potato crop in this region has been a good one this season. On low, undrained ground it was, owing to excessive moisture, almost an utter failure. An overflow of water will, perhaps, destroy the potato sooner than any other farm crop. The sweet potato is not so easily injured by it. I have no doubt that scab in potatoes is mainly caused by the application of fresh manure to the soil immediately before planting. There is a caustic property in the manure which the tender skin of the young potato can not withstand. Partially slaked lime applied to the soil will also, I believe, produce the same result. Fresh manure also produces rough and prongy tubers. To produce a good crop of smooth, handsome tubers a heavy clover or blue grass sod should be turned under in the fall before planting. In the spring the ground should be again ploughed to the depth of four or five inches, but not deep enough to disturb the clover sod. Furrows should be made only one way, and seed dropped about eight inches apart in the row and then covered with a one-horse bar-share plough. This season I planted whole potatoes of medium size on one acre of ground and on another acre I planted seed of much larger tubers, cut to one or two eyes—all of one variety—and could see no difference in quality or yield. The best early potato I have tested for many years is New Queen. It is of the best quality and its tubers are remarkably large, smooth and shapely. Last year it yielded at the rate of 90 bushels for one of seed, and it did better this season. Of long-keeping, late varieties I have found none quite as satisfactory as State of Maine and Green Mountain. They resemble each other in every way and are very productive. Tubers, white, smooth and handsome and of the best quality. But few too small for market and will keep without sprouting until April. Mature in August.

Muncie, Ind.



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# REPORTS OF VICE PRESIDENTS

## REPORT FOR FIRST DISTRICT.

JOSEPH A. BURTON, VICE PRESIDENT, MITCHELL.

In this district we have some of the finest fruit region in Indiana. On the hill land, which comprises most of the district, we have but few failures from frost. One man in Orange County has been growing Gregg raspberries for seven years, myself for six. We have had full crops every year. I have grown strawberries for six years. In 1888 lost about half the crop from late frost. The rest of the time a full crop. I owned a ten-acre apple orchard southwest of Mitchell for ten years. It yielded a full crop about two-thirds of the time. In the worst off years it never gave less than 10 per cent. profit above expenses on cost ($40 per acre). Near this is the celebrated orchard of Ransom Burton, which has never failed to yield a fair crop. I do not wish to be understood as stating that an apple tree in this locality has no off years, but that its off years are not usually caused by frosts. Nearly every year we have a fair crop of apples of some kind. In this respect I think we are far ahead of Michigan or Western New York. In some parts of the district there is an increased interest in small fruits. A great many strawberries and raspberries will be set next spring in Washington, Orange and Lawrence Counties. I would state that a raspberry here means a Gregg, if not otherwise designated.

Fruits of all kinds abundant this season and prices remunerative. To this there is one notable exception, that is, peaches. From some cause we get no more good peaches. If not killed by the cold winters or late frosts they are generally rendered worthless by some other misfortune.

## REPORT FOR THE THIRD DISTRICT.

W. A. WORKMAN, VICE PRESIDENT, GREENCASTLE.

We of Indiana are again reminded of the fact that ours is by no means the best climate for fruit. Apples, the king of fruits in a temperate climate, were barely half a crop. That is, not half a crop of perfect apples; trees were generally pretty full of bloom, but late frosts killed many of the blossoms, and the codling moth, as usual, rendered about half those left by the frost almost worthless. Those of us who depend in a good degree on fruits for profit are forced to the conclusion that there must be something done, and from the favorable reports we hear we have concluded that the thing to do is to spray our trees with poison water. But while on the apple I would not be understood to say that it doesn't pay to plant

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apple trees. For I think it does pay, even as it is carried on now, since fair to good fall and winter apples sell for about 20 cents more per bushel than do Irish potatoes; and for home consumption a tolerable apple is very much better than none. This has been a much better year to judge of the bearing qualities of apples than last year was, when nearly all sorts were loaded.

Ben Davis, as of old, was still the principal winter apple this season. But for bearing, beauty, quality and keeping it has a formidable rival in my orchard—the Missouri Pippin. I believe it is only behind it one particular, that is size; and the Missouri Pippin is by no means a small apple. Then we have another apple that, in my opinion. will rival the Ben Davis as soon as it is better known, that is the Pewaukee. It is large, fine looking, grows on a healthy tree, an abundant bearer, and to most tastes I think would be classed much ahead of Ben Davis. But if it is fine quality one is seeking he can do no better than plant Grimes' Golden and Roman Stem. Both keep fairly well, and are as good bearers as any winter apple except those I have mentioned. Stark, too, is receiving some attention, but it doesn't seem to keep so well as its appearance at picking time would indicate. It bears very well, and is a large, smooth, good apple.

We have several good winter sweet apples growing in my district, the Mosier Sweet, the Red Sweet Pippin and others; but I want especially to call attention to the Heike's Sweet: a fine, large, whitish apple, bears well, cooks about as easy as a sour apple, but for an eating apple it excels almost anything in the apple line. I have not fully tested its keeping qualities. The Benoni is coming into notice as one of the very best and most profitable summer apples.

Peaches were again a good crop in the southern part, at least, of my district. In most parts of Putnam County the crop would have been immense, only that the trees were scarce. During last year, as well as this, it has been noted that the seedling peach is the best bearer; and another fact has likewise been discovered, namely, that in many cases peaches reproduce themselves from seed.

Grapes would have been a fine crop, but they rotted very badly in many places.

The berry crop was rather a large one and prices ruled very low. This was notably the case with raspberries and blackberries, owing, of course, largely to the great crop of wild berries that were brought in.

The Erie blackberry fruited on my grounds this year, and is an immense yielder of fine large berries But I can not praise its quality. Snyder is still the leader in these parts, though Stone's Hardy and Taylor have fine points.

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## REPORTS FROM THE SIXTH DISTRICT.

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I. D. G. NELSON, FORT WAYNE, VICE PRESIDENT.

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FORT WAYNE, IND., March 4, 1890.

*C. M. Hobbs, Secretary:*

DEAR SIR:—I am in receipt of your postal card, calling me to duty, by making my report as vice president for this district, which owing to afflicting deaths and sickness in my family, had escaped my attention. I have only time to briefly say that the fruit crops of 1889, owing to the dry season and late spring frosts, have been unusually variable in different localties. Upon the whole, apples like

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the Newtown Pippin, Rhode Island Greening, Yellow Bellflower and other uncertain varieties, have done unusually well. One man in this county, George Bullard, sold from an old orchard that has never done remarkably well before, nearly or quite 1,000 bushels of Newtown Pippins at 40 cents per bushel for shipments to New York. The Ben Davis, that we are apt to speak lightly of, on account of its low grade in quality, continues to furnish for shipment, at 30 cents per bushel, the bulk of the trade. Shippers like to handle them on account of their uniformly smooth, handsome appearance, and bear rougher usage than any other variety. The apple product seems to be rather on the up-grade in this section of late, which is the more encouraging to farmers, who have somewhat large orchards, as all kinds of grain and stock farming has had a depressing outlook for some time, with no star of promise in the distance to brighten the prospects.

The grape and strawberry crops were seriously damaged by the late spring frosts, succeeded by extreme droughts.

The pear crop was generally good—in some localities very fine. My favorite, the Flemish Beauty (because I can eat more of them with impunity than any other), was an exception this year. They were affected by a rusty fungus that injured their appearance and prevented a full development of size and quality. An immense crop of that delicious little Seckel, sweeter and smaller than usual, if possible, was visible in our market. The Bartlett, Belle Lucrative and Beurre d' Anjou are all fine, and even an epicure could get through the season very nicely if he had no other varieties. The last named is a fine, thrifty tree with large foliage, and to my mind the most desirable of the latest maturing fall varieties. The fruit is uniformly large, smooth and attractive, as well as good, but unfortunately it is rather shy in furnishing abundant crops.

The Richmond or Early May cherry fairly overdid itself, and overdid the market last season. Very few of the sweet, finer sorts are successfully cultivated with us any longer. The old, ever-bearing black Morello followed in so soon after the Richmond that the canners were surfeited and the bottom dropped out of the market before the season was over.

Very respectfully,

I. D. G. Nelson.

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# REPORTS OF LOCAL SOCIETIES.

## REPORT OF THE WAYNE COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

Our society, under the above name, has been organized since January, 1884; but from the best information received, the Wayne County (or Richmond) *Horticultural* Society was organized about 1856. This society has had its seasons of *en*couragement and *dis*couragement, but it has lived through all, and during the past year, although the *paid* membership has not been so large as it was last year—numbering seventy members this year—yet we believe the interest manifested has been quite as good, and our attendance fully as large, for many who attend regularly do not pay, and our meetings usually exceed 100 members.

We have had special essayists from among our home talent appointed for the different meetings, who, with two exceptions, have met their appointments, either with a carefully prepared paper or an interesting talk, and in those two cases papers were volunteered in their stead. These papers and talks have been profitable and instructive, and a source of pleasure to the society.

At a few of our sessions subjects of discussion were introduced, and we found this an interesting feature.

During the year our meetings have been held at the residence of members, until the weather became too cool to have the houses open, when the large attendance made it advisable to meet in some public room, and our later meetings have, through the courtesy of our city officers, been held in the city building.

While we have held no regular fair this year, premiums have been given at four of our meetings, as follows: In May, to the ladies for the best loaf of salt-rising bread; in September the premiums were on grapes, pears, plums, peaches, flowers and grape jelly; in October they were on fruits, jellies, vegetables and flowers, and in November on chrysanthemums. On all of these occasions the display of exhibits was quite creditable. At every meeting there have been good exhibits either in fruits, vegetables, grains, flowers or miscellaneous articles. The premiums paid out amounted to $34.75.

### AGRICULTURAL.

The mild winter of 1888-89 was advantageous to the wheat, and the crop in our county is reported to be rather over an average crop. The yield has been good, most wheat having averaged sixty pounds to the bushel, though some has fallen as low as fifty-six pounds to the bushel.

In May the hay crop seemed to be a total failure, but it has proven a full crop, some meadows being very heavy, and yielding two tons to the acre. The clover yield has not yet been reported to the society.

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The odds were all against the corn crop this season, hence the yield is very light. The backward spring retarded the planting; then heavy rains prevented working it at the proper time; and, lastly, the grub worm made great ravages, until in places there will not be more than half a crop.

Early in the season the oats crop promised fairly, but the rust has reduced the yield to about forty per cent. of a full crop.

### VEGETABLES.

Sweet potatoes are small, but the quality is good; yield only fair. The crop of Irish potatoes is reported fine, save in a few neighborhoods. Those exhibited in our society have been unusually fine.

Pumpkins, squashes, beans, turnips and cabbage have done excellently.

### STOCK.

Some cholera is reported among the hogs. Cattle are doing well, but prices are low.

### HORTICULTURAL.

The grape yield was quite below an average, owing to two conditions: The frost late in the spring injured the germs, and later the rot struck the grapes, making the clusters quite imperfect.

Small fruits were about an average, though the cherry and strawberry crops fell short. Gooseberries yielded abundantly, as did blackberries and raspberries. Currants produced a fair crop.

### ORCHARDS.

In the early part of the season the orchards bade fair to produce abundantly, and in March the buds were reported safe, but the late frosts, and the ravages of insects, reduced the crop of apples to less than twenty per cent. of a full crop. Plums and peaches not above ten per cent. of a crop. Pears did well, and the butter pear was finer than for years.

In February a Farmers' Institute was held under the auspices of this society, and much interest was manifested in it, and we think it was beneficial in its results.

Our financial status is as follows:

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|---|---|
| Total receipts for the year 1889 . . . . . | $139 98 |
| Total expenditures for the year 1889 . . . . . | 81 38 |
| Leaving a balance in the treasury of . . . . . | $58 60 |

JESSE C. STEVENS,
*President.*

MARY PARRY, JR.,
*Secretary.*

RICHMOND, IND., 12th mo., 2d, 1889.

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## MITCHELL DISTRICT HORTICULTURAL SOCIETY.

OFFICERS FOR 1890.

Joseph A. Burton, President, Mitchell.
W. F. Sears, Vice President, Orleans.
Morgan Keane, Secretary and Treasurer, Mitchell.

This Society was organized in February, 1889, with ten charter members, by the assistance of President Furnas and the untiring efforts of our President, Jos. A. Burton. The membership is now twenty-nine. Our finances are in good shape for so young an organization. We are out of debt and have $30 in the treasury. Our meetings are held on the second Saturday in each month, and are well attended and successful when the weather is favorable. This was especially the case with the strawberry meeting held at the home of our President, Jos. A. Burton. There were some fifty persons in attendance, and the meeting was a pleasant and profitable one. The enjoyableness of the occasion was very much increased in the partaking of Mr. Burton's delicious strawberries, of which he had had an abundant supply for a period of five or six weeks.

We held an interesting raspberry meeting at the home of W. F. Sears, near Orleans, who, with his brother Thomas, near by, are growing raspberries extensively for market. W. F. sold 3,000 gallons of raspberries the past season in Chicago at good prices.

We held a good meeting at Ransom Burton's, our most extensive apple grower. Mr. Burton has forty acres in orchard, mostly apples, embracing about fifty varieties, with a good assortment of pears, plums and cherries. Mr. B. is a great admirer of the Grimes' Golden. He thinks it is the apple to grow for home use and market. Other meetings were held at the homes of members.

The past season was favorable for small fruits. Strawberries and raspberries were all that could be desired. Cherries were abundant, but more or less faulty. Pears were a moderate crop, somewhat wormy. Apples were good in size, but deficient in quality and quantity; some varieties not more than one-third crop; plenty for home use and some for shipment. Winter varieties are not keeping well on account of warm weather.

The summer meeting of the State Horticultural Society, held in Mitchell, August 6 and 7, was a treat we recall with pleasure. It was the most pleasant and profitable meeting of the kind we ever enjoyed. As to the President, Dr. Allen Furnas, some of us had a short acquaintance with him, but we had come to look upon him as a kind friend and able worker in the cause of horticulture. We hereby tender him our thanks for the interest he took in organizing our Society, and for his wise counsel and advice, which we will gratefully remember.

MORGAN KEANE,
*Secretary.*

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## REPORT OF THE MARION COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

This Society meets on the second Saturday of each month, holding out-door meetings, commencing in May until October, inclusive; the rest of the year we meet in the rooms of the State Board (in State House). This Society is in a prosperous condition. We held, during the past year, four (4) exhibitions, at which time we have paid the sum of one hundred and seventy-five ($175) dollars in premiums as follows: Strawberry, raspberry, vegetable and culinary, including all fruits and flowers of the season, and live stock at one of them. We have had papers on different subjects, by parties of experience on the following topics: Fruits, varieties best adapted to our climate and locality; Care and management of stock; Culture of flowers; Household economy; How to make the most money on a few acres of land; and on other subjects equally as important, followed by discussions upon each subject.

In order to replenish our treasury, we charge a membership fee of 50 cents per annum for all male members, ladies free. The attendance at our meetings has not been as large as we desire, but they have been full of interest. Our Society is composed of the best farmers, gardeners and fruit growers of the county. At our last election of officers (which occurs on the second Saturday in March, annually), the following officers were elected for the ensuing year: E. J. Howland, President, Howland, Ind.; S. M. Patton, Secretary, Howland, Ind.; Mrs. Wm. B. Flick, Treasurer, Lawrence, Ind., with one Vice President from each Township in the county. Our Society has increased, both in membership and interest, the past year, and we hope to still increase it more the coming year if work will do it.

S. M. Patton,
*Secretary.*

## REPORT OF FLOYD COUNTY HORTICULTURAL SOCIETY.

The Floyd County Horticultural Society held fourteen formal meetings during the past year. Some of our meetings have been very interesting and edifying. The subjects of most interest were as follows: "Farm Life;" "The First Horticultural Society;" "Meteorology;" also, an excellent lecture from our old State Geologist, Prof. Borden, on his recent tour through Germany, giving the manners and customs of the German people, and descriptions of their vineyards, their wines, their old castles on the beautiful Rhine, etc.

A fruit exhibit took place on Saturday, May 18, which was fairly successful, taking rainy weather into consideration.

On the 29th of August, an exhibition of fruits and farm products was held in the grove adjoining the Edwardsville school-house (which has been our regular place of meeting), which was very generally considered a success. The occasion was one of interest and social enjoyment. We had the pleasure of being favored with quite a number of visitors from a distance.

One of the noted features of the year was a basket meeting at the residence of Jonathan Beard. The day was passed in looking over the fine premises, the

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orchards, the berry patches, a variety of evergreens and deciduous trees, excelled nowhere in this part of the country. Then, the dinner spread and dispatched, music made the occasion one not to be forgotten by those that were present.

Our Society, in competition at the State Fair, with collections of different varieties of fruits, carried off premiums to the amount of thirty-three dollars; membership increasing slowly; numbers, fifty-four. The Society has decided to build a hall for its use, and expects to have it finished by the coming spring. It also has high expectations of having the State Horticultural Society meet with them the coming year at Edwardsville.

F. M. YENOWINE,
*Secretary.*

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## REPORT OF MONROE COUNTY HORTICULTURAL SOCIETY.

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We number fifty-seven members. Our officers are: I. Milt Rogers, President; W. H. Neeld, Vice President; W. M. Bunger, Secretary, and J. S. Dinsmore, Treasurer. Our regular time for meeting is the second Wednesday in each month. Place of meeting, at the Court House or residence of some member of the Society. The meetings during the year have been well attended.

We received first premium at the State Fair on display of fruit, premium $100, given by the State Horticultural Society. We held a fair in Bloomington on the 10th, 11th and 12th of October. There was a fine, large display of fruit, three large collections of flowers, vegetables and table luxuries.

We had in the treasury at the beginning of the year, $35; dues and other resources, $10; sale of tickets at fair and other resources, $142; premiums and sale at State Fair, $105; premiums paid and other expenses, $189; leaving a balance of about $75 in the treasury.

W. M. BUNGER,
*Secretary.*

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## HOWARD COUNTY SOCIETY.

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On March 18, 1889, at New London, the Howard County Horticultural Society was organized and has held regular meetings since. As in all societies there are some who take little or no part, but to the many who do attend and take part there has been great benefit. The Society meets monthly at the homes of the members. We have an active membership of twenty-three.

President—Dr. S. Newlin, New London.

Secretary—Matthew T. Wilson, New London.

M. T. WILSON,
*Secretary.*

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## DELAWARE COUNTY REPORT.

The Delaware County Horticultural Society has done much good work the past year, and is now in a flourishing condition.

The programme and places of meeting are made out for the year, and the Society meets the second Wednesday of each month. Most excellent papers have been prepared and read before the Society, and were well discussed, and much information gained from them. Financially the Society is in good condition.

There are at present about twenty members, but their families and friends are always welcome.

The officers are: F. J. Claypool, president; Mrs. Dr. Hathaway, vice-president; John Fullhart, treasurer; Ida Meeker, secretary.

Respectfully, IDA MEEKER,
*Secretary.*

## REPORT OF HANCOCK COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

The Society's meetings are held on the third Saturday in each month. The time is usually taken up in reading papers on "Fruit and Garden Culture," "Varieties," etc, followed with interesting discussions.

The attendance is not as good as it should be. Membership about fifteen.

OFFICERS: President, B. F. Coffin, Westland; Vice-president, B. F. Stinger, Charlottsville; Secretary, William B. Walker, Greenfield; Treasurer, J. K. Henby.

## ORANGE COUNTY AGRICULTURAL AND HORTICULTURAL SOCIETY.

This Society was organized in December last, and has held one regular meeting. The Society starts out with a membership of seventeen.

OFFICERS: President, Thomas M. Sears, Orleans; Vice-president, John O. Elrod; Secretary and Treasurer, Henry Reed, Orleans.

HENRY REED,
*Secretary.*

## GRANT COUNTY SOCIETY.

Our meetings are held on the third Saturdays in each month, at 2 o'clock P. M.

In June we hold a pic-nic meeting which is usually well attended. Sometimes our meetings are small, not more than a half dozen present, but the papers and discussions are interesting and profitable. During the year there have been twelve or fifteen papers read on horticultural topics, with discussions, etc. Membership, about eighteen or twenty.

OFFICERS: President, Snead Thomas, Marion; Vice-president, O. P. Morehead, Marion; Secretary, J. H. Fisher, Marion; Treasurer, Laura Fisher, Marion.

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## HENDRICKS COUNTY SOCIETY.

The Society holds monthly meetings. The July meeting was held at H. Hadley's. Dr. J. Q. Allen read a well-prepared paper on "Agriculture Conducive to Healthfulness." The annual fair was held on the farm of J. M. Barlow, near Plainfield, and was quite a successful one. Judge John V. Hadley, of Danville, read an interesting and valuable paper on "How to Keep the Boys on the Farm."

The farmers have had a fairly successful year and fair promise for the one to come.

J. M. BARLOW,
*Secretary.*

## PREMIUMS AWARDED BY THE INDIANA HORTICULTURAL SOCIETY AT THE STATE FAIR, 1889.

Best display of fruits by any local horticultural society:
First premium, $100, Monroe County Society.
Second premium, $50, Marion County Society.
Third premium, $25, Lawrence County Society.

### INDIVIDUAL PEMIUMS.

W. H. Neeld, Bloomington, Monroe County:
Best plate Rambo, $1.
Best plate Rome Beauty, $1.
Best plate Wine Sap, $1.
Best plate Willow Twig, $1.
Best plate Yellow Bellflower, $1.
Best plate Seedling, $1.

W. A. Workman, Greencastle, Putnam County:
Best plate Grimes' Golden, $1.
Best plate Ben Davis, $1.

Mrs. W. B. Flick, Lawrence, Marion County:
Best plate Maiden Blush, $1.
Best plate Fall Pippin, $1.
Best plate Tulpehocken, $1.
Best plate White Pippin, $1.
Best plate Clayton, $1.
Best plate Northern Spy, $1.
Best plate Baldwin, $1.
Best plate crabs, $1.
Best plate pears, $1.
Best plate peaches, $1.

Jonathan Beard, New Albany:
Best twenty varieties of apples, $12.
Best twelve varieties of apples, $8.
Best five varieties of pears, $4.
Best five varieties of grapes, $5.
Best three varieties of grapes, $3.

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# *INSECTICIDES—THEIR USE, PREPARATION AND APPLICATION.

BY PROF. F. M. WEBSTER, OF THE U. S. DEPT. AGRICULTURE, LAFAYETTE, IND.

The liquids and substances used in destroying insects may be divided into three classes. (1) Such as require to be taken into the system with the food, and which contain more or less arsenic. (2) Such as have an effect external in its character, and do not require to be eaten. (3) Such as are used as repellants.

The first class is composed of Paris green, London purple, and white arsenic. These are deadly poisons, fatal alike to man and animals, as well as insects, and should be used with caution.

PARIS GREEN.—This substance may be used either mixed with water, or in the dry state mixed with flour and dusted on to the plants to be protected. If used dry, a proportion of one pound of green to twenty-five pounds of flour is to be recommended. This is dusted over such plants as the potato, but should not be used upon such portions of vegetables as are used as food. Nor should it be thus applied upon low bushes or shrubs whose fruit is near ripening. It may also be used pure, and dusted on clover which is afterwards to be laid down in small bunches between rows of young corn, cabbage, and other vegetables, as traps or baits for cut-worms, which collect under the clover, and, eating of the poisoned leaves, will thus be destroyed. Cabbage leaves, treated in this way, will also attract and destroy cut-worms.

As a liquid mixture, this substance is the most popular, and, in this way, can be made to answer all purposes for which it is used in the dry. Used in this form, one pound of the poison to one hundred and forty or fifty gallons of water, if applied in the form of a spray, by the aid of any of the machines mentioned at the end of this paper, it will be found effective against the codling moth, and all leaf-eating insects which affect the apple, provided such application be made after the bloom has fallen and before the calyx end of the fruit has turned downward. It may also be used in this way to destroy leaf-eating insects infesting other trees or shrubs, provided the fruit, if any, be not more than half-grown.

For the codling moth, trees should be sprayed with this mixture for the first time just after the bloom has fallen. The second application should follow in about ten days or two weeks, and the third about ten days after the second. This last application may safely be dispensed with, however, if the season be dry and few showers fall during the periods between applications, or soon after the second. Only enough of the mixture should be be used to wet the foliage, without drenching it, as it has been found that, with this amount, enough of the poison will become lodged in the calyx of the apple to destroy the young worm as soon as it hatches and partakes of its first meal. Great caution must be exercised to keep this poison well mixed, as, being heavier than the water, it sinks rapidly to the bottom of the vessel, and there is danger of some of the mixture thereby becoming too weak to be effective, and some of it so strong as to kill the foliage. No attempt should be

* [At the annual meeting the Secretary was directed to prepare a paper on this subject, for publication in this volume. Being crowded for time, and not having the material all at hand out of which to treat the subject as its importance demanded, he requested Prof. Webster to prepare a paper for us on this topic. He kindly consented to do so, and we have this concise, practical presentation of the subject, for which the Professor has our thanks.—SECRETARY.]

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made to spray the trees after the apples have changed their position and the stem end is upward, as the poison will only collect and settle in the cavity about the stem, and render the use of the fruit dangerous to human life.

For the plum curculio the same solution can be used; also, in the form of spray, but may be applied earlier, or when the plum trees are coming into leaf, and again after the blossoms fall and the young plums are the size of peas. For this, however, a weaker solution may be used; say one pound of green to one hundred and sixty gallons of water.

London Purple.—The use of this substance as an insecticide is displacing Paris green, from the fact that it is cheaper and more easily kept suspended in water, and hence the liability to injure the foliage is less, although it is really the stronger substance of the two. It may be used to destroy any or all of the insects which are affected by Paris green, and a mixture of one pound to one hundred and sixty gallons of water will be found amply strong, which should be applied in precisely the same manner. For the plum curculio, this seems preferable to Paris green, and good results have been secured by spraying plum and cherry trees as soon as the bloom has fallen.

White Arsenic.—This substance is sometimes used instead of the two preceding for destroying the codling moth, but it is the least popular of the three. When used in the form of a spray, one-half pound of arsenic to one hundred gallons of water will be found sufficiently strong. The verdict heretofore has been that this mixture was more expensive and more liable to injure the foliage, while the color of the substance itself was more likely to cause its confusion with other substances, thereby rendering it much more dangerous to keep about the premises. It does not appear to possess any virtues, as an insecticide, that are not contained in either Paris green or London purple.

These three substances include all that are in general use as insecticides and all that are at present of interest to fruit growers. They may be used in destroying the following insects: The apple worm, plum curculio, canker worm, tent caterpillar and such other insects as devour the foliage of trees. The Colorado potato beetle can best be fought while the plants are very young by using the dry mixture, but later, when the vines are larger, the liquid solution will be found the most effective and more easily applied. They will also destroy the currant worm and the larvæ of the raspberry saw fly and other insects of this nature, but it is dangerous to apply these mixtures among small fruits, and they are no more effective than other, less dangerous insecticides. These substances will not destroy the squash bug, chinch bug, tarnished plant bug, plant lice or barklice.

The second class of insecticides, or such as kill by contact, and do not require to be eaten, is composed of a considerable number of fluids and substances, the following being those in most general use: Kerosene emulsion, pyrethrum, white hellebore, tobacco, soap-suds, lye, soft soap, road-dust, lime, ashes, coal tar and carbolic acid.

Kerosene Emulsion.—This mixture is one of our most useful insecticides, being perfectly harmless to human life, composed of ingredients found in every household, and withal is very effective. It can be used against nearly all insects which are within its reach and the cost is but a trifle.

There are two ways of preparing the emulsion—one by taking equal parts of kerosene and milk, the other by dissolving one-half pound of whale oil or other bar soap in one gallon of hot water, and after removing from the vicinity of the fire add one gallon of kerosene. The last formula is the most practical. With the ingredients together in a suitable vessel, detach the spray nozzle from the pump, place

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the end of the hose in the vessel, and by working the machine draw the mixture out and force it back rapidly until it is of the consistency of thick cream, which may require from five to ten minutes. Having thus made the emulsion, mix it with cold water until it is reduced to the desired strength. say three to five per cent. kerosene. Either of the two kinds of emulsion applied in the form of spray, precisely as in case of the arsenical mixtures, will destroy plant and bark lice, chinch bug, squash bug, and, in fact, nearly all insects which are found in exposed positions.

PYRETHRUM.—This is known also under the names of insect powder and bubac. It is purely vegetable in its nature and absolutely harmless to man. It can be used anywhere in the garden, on edible vegetables or ripening fruits, and is one of the best remedies for the cabbage worm. In purchasing, care must be taken to secure a pure article, which has been kept in a tight receptacle. It must be kept in tight packages, as exposure to the air destroys its effectiveness. It can be used as a spray by mixing one ounce to a gallon of water, or dry by mixing it with ten times its bulk of flour. The dry ingredients must be thoroughly combined and kept for twenty-four hours in a tight vessel before using. In either form it will destroy all soft-bodied larvæ like the rose and cherry slug, caterpillars, the cabbage worm, currant worm and most of the smaller beetles and bugs. Its effect is not instantaneous, but the insect often lives for some hours after being affected.

WHITE HELLEBORE.—This is comparatively harmless to man, but had best not be used on vegetables like the cabbage, or on ripe or nearly ripe fruit. It is used like pyrethrum, and is very effective against the currant worm, raspberry worm, cherry slug and insects of this sort.

TOBACCO.—This is used as a decoction, and also in fumigation, under which last form it will be further noticed under insecticides of the third class. A strong solution, made by soaking in water is used to destroy plant lice, and as a wash for flowering plants.

SOAP SUDS.—A strong solution of soap of any sort, and especially of whale-oil soap, is valuable as a wash for destroying soft-bodied insects, and when used in the form of spray will often destroy the larger insects, which would not succumb to any of the insecticides of the class previously mentioned, emulsion excepted.

LYE —One pound of concentrated lye, when dissolved in one gallon of water, is an excellent solution to spray upon trees to destroy soft-bodied insects

SOFT SOAP.—This, besides being used as a constituent of soap suds, can also be used to protect fruit trees from the attacks of borers. For this purpose, the soap is mixed with carbolic acid, or it may be mixed with a strong solution of washing soda. If carbolic acid is used, one quart of soap is added to two gallons of boiling water, into which mixture is stirred one pint of crude carbolic acid. If washing soda is used the soap is reduced to the consistency of paint by a strong solution of the soda. Either of these mixtures should be applied to the trees early in June and again about August, by painting the trunks, and perhaps, the larger branches. This forms a sort of varnish or tenacious coating, not easily dissolved by rain, and very repulsive to the mother borer, who may be searching for a desirable place to oviposit.

ROAD-DUST, LIME AND ASHES.—These are sprinkled or dusted on plants infected by plant lice, slugs and such insects as are more or less covered with sticky fluids. Lime is often dusted on currant and gooseberry bushes to destroy the currant worm. Experience has, however, demonstrated that these measures are not always reliable.

COAL TAR.—This may be painted on trunks of trees for the same pur-

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poses as the soft-soap mixture; or, by placing a few quarts in a barrel of water, a solution may be made for spraying to drive off such insects as the rose beetle.

CARBOLIC ACID.—This is a deadly poison, and must be used with proper caution. A mixture of one part to one hundred parts water is used to destroy insects on plants and larvae about the roots. A stronger mixture, say one part to seventy-five of water, is used to destroy ants, which burrow in lawns and under brick walks.

The third class of insecticides, or repellants, may some of them destroy also, especially when used for fumigation. Some of these are carbon bisulphide, benzine, turpentine, oil of pennyroyal and tobacco.

CARBON BISULPHIDE.—This is not only a poison, but also an explosive, if brought too near a light or fire, and hence must be used with great caution. If poured into holes made in the earth among the roots of plants the fumes will destroy such insects as may be congregated on or about these roots; provided the holes be immediately refilled to prevent the fumes escaping. Confined in tight vessels with seeds infected by insects, like the pea and bean weevils, it will destroy them in the same manner.

BENZINE.—This is another explosive, and must be used with caution. Will destroy insects infesting cracks and crevices, in walls and furniture, if forced into such places.

TURPENTINE.—This will destroy whatever insect life it is brought in contact with, and it is also used to repel insects, its fumes being very distasteful.

OIL OF PENNYROYAL.—The fumes of this are very disagreeable to insects, and it may be rubbed upon the face and hands to keep off mosquitoes and flies, or it may be allowed to evaporate in rooms to drive away these intruders.

TOBACCO.—The fumes of burning tobacco is a well-known remedy for the "green fly," and, in fact, all kinds of aphides or plant lice. A paper cone placed over plants affected by plant lice, and smoke of tobacco introduced, will soon destroy these insects. Quite recently it has been learned that the fumes from evaporating juices of tobacco will also kill "green fly."

The foregoing includes all of the generally employed insecticides applicable to Indiana fruits. Others there are, but their use has not yet passed beyond the boundaries of experimentation. When asked to prepare this paper it was stipulated that only such insecticides should be included as had been thoroughly tested, and that the subject should be treated without reference to who had discovered these remedies, or who had determined their value. Therefore, it can only be stated that the information here given has been secured by no one person in particular, but represents the work of all, or nearly all, of the economic entomologists of the United States.

The following are some of the machines and contrivances used in the application of these insecticides, with the names of the firms supplying them, and also the prices. Illustrations of these are given where it has been possible to secure them, which will aid the intending purchaser to select with more intelligence. These companies furnish several different styles of machines, and persons wanting should send for their illustrated and descriptive price lists.

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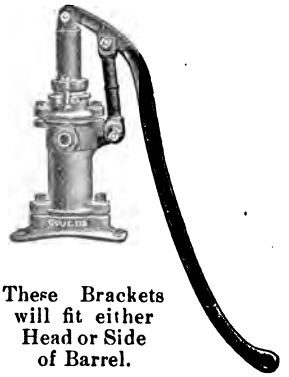
## SPRAYING PUMPS MANUFACTURED BY THE GOULDS MANUFACTURING CO.,

SENECA FALLS, NEW YORK.

Gould's Spraying Pump spraying eight rows of plants.

Gould's Spraying Pump spraying two rows of trees.



These Brackets will fit either Head or Side of Barrel.

Fig. 905 represents our New Double Acting Force Pump, arranged for either hose or gas pipe discharge, for spraying trees, cotton plants, etc., with a solution of tobacco water, or water diluted with Paris green or any other poisonous mixture. This Pump is especially adapted for diffusing liquids or poisons of any kind upon trees, shrubs or plants, affected by bugs, worms, insects, etc., and is capable of doing infinite more service than any of the smaller and cheaper Pumps in the market, as it is of greater capacity, and being double acting, throws a continuous and powerful stream, which can be diffused over a vast area by means of spreaders or sprinklers. When used for diffusing a solution of water diluted with Paris green, on cotton plants, they should be screwed for ½ inch iron pipe, and arranged as shown in cut with gas pipe arms and spreaders; and when wanted for spraying trees they should be fitted with ¾ inch hose nipples for attaching hose, as is also shown in cut.

Either of the discharges may be utilized as a return pipe to mix contents of barrel, although non-soluble ingredients like Paris green must be stirred from bottom to prevent settling.

With these pumps two rows of trees or eight rows of plants can be sprayed, thus saving one-half the labor usually expended. See sketches of Pumps in operation elsewhere.

PRICE, $8.50.

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These machines, Nos. 1 and 2, are made by the Nixon Nozzle and Machine Co., Dayton, Ohio.

No. 1.

ORCHARD AND VINEYARD CART.

PRICE, $55.00.

The above cut represents our Orchard and Vineyard Cart. It is of recent invention, although we have contemplated a machine of this design for some time, but did not execute our purpose sooner from the fact that we were not fully advised as to the most suitable, general purpose apparatus, that would meet the requirements. After an interchange of opinion with leading fruit and grape growers, we feel confident in saying that we have produced a cart that can be utilized for all purposes wherein spraying is required. The same is mounted on iron wheels, three feet in diameter, and the width of tread is three feet, six inches, and the machine has detachable shafts so that the same is readily adapted to shipping. A barrel is securely mounted on the forward part of the cart frame, the force pump on the rear at the right side, and central on the frame is the seat for the operator. A pipe leads from the pump to a transverse pipe at the front, to which are attached at both ends the spraying nozzles. These are adjustable, so that any desirable direction is given to the spray. Union couplings are used so that tubing may be attached to the pump, and thereby adapted to spraying for all purposes whatever. We furnish sixteen feet of discharge hose and five nozzles with the machine. The vessel is provided with an agitator, so that the spraying material shall at all times be equally effective. In a word, it is a simple, compact, substantial spraying cart, well adapted in all its several parts to the uses for which it was designed.

We also manufacture this same machine with a five foot tread to spray potatoes, tobacco, and any crops planted in rows.

CLIMAX PUMP No. 2.—PRICE, $15.00.

This pump is made entirely of iron and brass, all parts that have to bear any strain being malleable iron. The legs are made of gas pipe and screw firmly into the base. This pump can be taken apart and shipped in a very small box and



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easily set up by the purchaser. It can be attached to any kind of vessel or tank by means of our brass connections, in ten minutes; or the suction hose can be dropped into a barrel, trough, or cistern with equal success. We sell this pump complete, with twenty feet of hose, sixteen feet discharge, four feet suction, two nozzles, and the necessary connections for it, as shown above. We do not furnish the barrel or

No. 2.
(Patented January 22, 1889.)

vessel, but merely show it in this cut to give an idea of what we consider a practical manner of connecting it. Any person can prepare this barrel and rack, as shown above, in a few minutes. The agitator, the handle of which is shown on top of the barrel, is a very complete and successful thing. It costs $1.00 extra. This pump and connections undoubtedly constitute the best cheap apparatus for spraying purposes ever put on the market.

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THE FLORIDA SPRAYING PUMP—MANUFACTURED BY RUMSEY & CO., SENECA FALLS, N. Y.

This cut represents our New and Improved Force Pump, the best and cheapest Pump of the class ever put on the market. It has a greater capacity than many

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more expensive pumps; it will throw a continuous and powerful stream to a height of forty feet or more, and when used with hose, and our "Gem" or "Dandy" nozzle, it will diffuse a poisonous solution over a wide area, and destroy insects, bugs or worms which attack plants and trees. It is the best Spraying Pump ever offered to the trade, and as such it will become invaluable to the farmer, orchardist and horticulturist.

Price, with 3 feet of hose, spraying nozzle, and sufficient 1¼ inch gas pipe to reach the bottom of an ordinary barrel . . . . . $12 00

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## LEWIS' COMBINATION FORCE PUMP—CATSKILL, N. Y.

The above cut shows the three combinations.

A cheap, convenient pump for spraying small orchards and plantations.—SECRETARY.

### DESCRIPTION.

This Pump is made of heavy, mandrel-drawn brass tubing, is 32 inches long, and about 1⅞ inches in diameter, weighing about 4½ pounds. It is a combination of three very useful instruments or machines (see cut above)—a Force Pump, a Potato Bug Exterminator or Agricultural Syringe, and a Veterinary Syringe.

### PUMPS.

As a Force Pump, with its three feet of hose attached, it will throw a good-sized stream of water from fifty to sixty feet. For washing wagons, windows, floors, sides of houses, gardens, sprinkling croquet grounds, lawns, etc., etc., or as an *ever-ready* Fire Extinguisher, it is the best in use; and its cost, including Exterminator and Veterinary Syringe, *is one-half less than any other good pump* in market.

### OUR NEW SPRAY ATTACHMENT

Is one of the finest attachments ever put upon a Pump. Being attached to the nozzle, a single movement of the thumb produces a spray or solid stream instantly. The attachment is made of brass, and *can not* get out of order.

We also make an "Insect Spray Nozzle," which throws a very fine spray or mist. Parties having a large amount of spraying of trees, etc., should not fail to order this nozzle. It will be sent extra, with three feet of hose, for only 50c. additional. No extra charge if you do not want the regular nozzle for washing wagons and windows, putting out fires, etc., but parties having orchards to spray would advise you to buy both. Price of Pump complete, with the extra hose and nozzle, express paid, $6. This includes *both* sets of hose and nozzles.

### AGRICULTURAL SYRINGE.

The pump part unscrews near the base, opposite where the hose is attached, and the perforated or syringe nozzle is screwed on in its place. There is also an

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extra piston or plunger, which is fitted with Lewis' Patent Expansion Valve, used in connection with the Exterminator, which holds the liquid at any point in the tube except on pressure of the handle. This extra handle and valve will be sent for only 25c. extra; with this you can convert the Agricultural Syringe into a Potato Bug Exterminator.

THE VETERINARY SYRINGE.

This is something every stockman in the country should possess. With this combination you have it always on hand, and if your horse or cow is sick and needs it you do not have to run two or three miles for a Veterinary Syringe, as is often the case in the country. The Injector can be guaged from one gill to one quart at a filling.

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## FIELD FORCE PUMP CO.'S "PERFECTION" SPRAYING OUTFIT FOR HAND POWER—LOCKPORT, N. Y.

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### IT SUPPLIES THE SPRAYING NOZZLE AND KEEPS THE LIQUID STIRRED UP IN THE BARREL.

Fig. 1.—Outfit complete.

Fig. 2.—Outfit in operation.

*One Hundred Trees Per Hour can be Sprayed With this Outfit.*

This pump is fitted with TEN feet of discharge hose and a graduating spray nozzle, the above being attached to the pump at the spout "A." At the aperture "B" is attached three feet of return hose, at the lower end of which is connected a discharge pipe, so that, at every stroke of the pump, a small portion of liquid is re-discharged into the tank near the bottom of the suction pipe, which keeps the poison and water well mixed. There is also a tight cap furnished, to close up opening "B" when desired.

The pump has a three-inch cylinder, and is furnished with an iron suction pipe, ready to mount on a barrel. Weight, 55 pounds. This outfit is also furnished with a fine strainer at bottom of suction pipe, which will effectually prevent leaves or dirt from getting into pump or nozzles. The price of the outfit, complete (not including barrel), is $12. Brass cylinder, plunger and rod can be furnished, when desired, at extra expense.

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Prof. E. S. Goff, of the Wisconsin Experiment Station, related result of spraying, not only to destroy the codling moth, but also to prevent apple-scab. From experiments the past year in the orchard of A. L. Hatch, he thought a safe and sure preventative of apple-scab had been found. The formula is an ounce of carbonate of copper dissolved in a quart of ammonia and diluted one hundred times with water. Spraying the trees with this solution practically prevented the scab. Fruit produced on trees thus sprayed was so free from scab that 75 per cent. of it was marketable, while that on trees not sprayed gave but a small proportion of marketable fruit. The spraying should commence about the time the blossoms fall, and be repeated once in two weeks until six or seven applications have been made. To do this properly would not cost more than 15 cents per tree, to spray both for scab and the codling moth, both mixtures, the above and London purple being applied at once.

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# RECOMMENDED FRUIT LIST BY COUNTIES.

## REPORTS FROM SEVENTY-EIGHT COUNTIES.

Blanks to be filled out and return, were sent to from four to six leading fruit growers in various parts of the ninety-two counties of the State, as we were able to secure their names and addresses. The blanks were accompanied with the following letter of instructions:

### OFFICE OF SECRETARY INDIANA HORTICULTURAL SOCIETY.

BRIDGEPORT, INDIANA, 1890.

DEAR SIR—There is a constant demand from the inexperienced for a reliable list of the varieties of fruits suited to the various localties, situations and soils of the State.

It is the purpose of this Society to meet this demand, as nearly as can be done, by requesting leading fruit growers in each county of the State to fill out the enclosed blanks with such varieties as are profitable to plant in their respective localities.

It matters not how highly recommended a variety may come, from some other part of the country, we do not want it in this list unless it has proven to be profitable in your locality.

It is intended that this list shall be a reliable guide to the inexperienced planter in every part of the State.

It can not be made such, except we get reliable reports from each county of varieties that have proven profitable for a series of years. The list will not be long when varieties are put to this test.

This information will be of vast benefit to the fruit growing interests of the State, and we trust you will assist us all you can in this valuable and much needed work.

INSTRUCTIONS FOR FILLING BLANKS.

Under each class of fruits named, write plainly all the varieties that have proven reliable and profitable and that you can recommend for planting in your locality. The variety you think possesses most merit, place first on the list, and so on in order of merit; state whether for home use or market, or both. Under the head of "Promising" give the names of newer varieties that have fruited one or two years and promise well.

These lists are wanted for publication in our annual report which we hope to have ready early in March. It is important that these blanks be filled as carefully and early as possible.

All persons sending in filled blanks will receive the annual report of the Society for 1889, containing a recommended fruit list from each county in the State, besides other valuable horticultural matter.

C. M. HOBBS,
*Secretary.*

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It was our ambition to have a report from each county in the State, but after repeated efforts we failed to get reports from several counties. This we think is chiefly due to the lack of interest in fruit-growing in those localities. In the counties where fruit-growing is a prominent interest we invariably got prompt and good reports. We would like to have a good list for each county not represented here, and some that are represented are not as complete as they should be. These lists and amendments can be forwarded to the Secretary any time during the year, and they will appear in the next annual report. While these lists have defects, and some of them not as complete as we would like, yet there are many counties that have furnished as complete and reliable lists as it is possible, with our present knowledge, to furnish. We believe these lists will be of more value to the fruit-growers of the State than anything we have ever had in this line.

Some of the lists do not give many varieties; this is all the better for the planter. One of the greatest obstacles in the way of successful fruit-growing is the planting of too many varieties, and those not suited to the locality. There are but few varieties in each class of fruits that are profitable in a given locality. Where there was more than one report from a county, they have been condensed, and when varieties were named by one person only, they were generally dropped out and the varieties more nearly recommended by all were placed in the list. So it will be seen that the counties sending in the larger number of lists are likely to be the more reliable, as it represents a greater number of opinions and covers a greater variety of soils and situations.

The circular letter accompanying the blanks sent out calls for the varieties in the order of their merit. We believe this has generally been adhered to, but not in every case. We also asked that it be specified whether varieties were for home use or market. This was so seldom done that we leave this feature out. This list has given us an immense amount of correspondence and work, and we trust it will be of corresponding value to the State.

Reports are still coming in as we go to press, but if the report is to get into the hands of those interested in time to be of any help to them this year, they must be gotten out at once. SECRETARY.

## ADAMS COUNTY.

APPLES. *Summer*—Early Harvest, Sweet Bough, Red Astrachan.
*Fall.*—Rambo, Maiden Blush, Western Beauty, Northern Spy.
*Winter.*—Wagoner, Smith's Cider, Ben Davis, Seek-no-further, Peck's Pleasant, Baldwin, Rome Beauty.
*Promising.*—Wolf River, McIntosh Red, Mann, Russian Monarch, Lawver, Pewaukee.
*Crabs.*—Transcendent, Crane's Cluster, General Grant.

PEACHES. Not profitable.

PLUMS. Weaver, Damson, Moore's Arctic.
*Promising.*—Niagara, Yellow Egg.

PEARS. Bartlett, Clapp's Favorite, Flemish Beauty.
*Promising.* Kieffer.

CHERRIES. Early May, May Duke.
*Promising.*—Dye House.

QUINCES. Orange.

GRAPES. Concord, Moore's Early, Rogers' Hybrid No. 22, Ives, Champion.
*Promising.*—Niagara, Empire State, Pocklington, Brighton.

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CURRANTS. Fay's Prolific.
GOOSEBERRIES. Houghton.
BLACKBERRIES. Snyder.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg.
STRAWBERRIES. Mt. Vernon, Iron Clad, Crescent, Captain Jack.
*Promising.*—Jessie.

## ALLEN COUNTY.

APPLES. *Summer.*—Red Astrachan, Benoni, Chenango, Primate, Yellow Transparent.
*Fall.*—Maiden's Blush, Duchess Oldenburg, Wealthy.
*Winter.*—Rhode Island Greening, Baldwin, Northern Spy, Ben Davis, Newtown Pippin, Yellow Bellflower, Willow Twig.
*Crab.*—Whitney, Transcendent.
PEARS. Flemish Beauty, Bartlett, Clapp's Favorite, Seckel, Belle Lucrative, B. d' Anjou.
CHERRIES. Early May, Montmorency.
PLUMS. Lombard, German Prune, Moore's Arctic.
GRAPES. Concord, Worden, Moore's Early, Ives, Pocklington, Niagara.
CURRANTS. Red Dutch, Versailles, White Grape, Fay's.
GOOSEBERRIES. Downing, Houghton.
BLACKBERRIES. Snyder, Ancient Briton.
RASPBERRIES, BLACK. Souhegan, Gregg.
RASPBERRIES, RED. Turner, Cuthbert.
STRAWBERRIES. Crescent, Cumberland, Bubach, Haverland, Logan.

## BARTHOLOMEW COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, American Summer Pearmain, Benoni, Sweet Bough.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden Blush, Fall Pippin, Fall Wine, Morris (local name), Rambo Wealthy.
*Winter.*—Grimes' Golden, Rome Beauty, White Pippin, Rox Russett, Smith's Cider, White Bellflower, Yellow Bellflower, Vandevere, White Winter Pearmain, Ben Davis, Wine Sap, Lawver, Baldwin, Romanstem, Father Abraham.
*Promising.*—Mann, Pewaukee.
*Crabs.*—Transcendent, Hyslop.
PEACHES. Amsden, Alexander, Crawford's Early, Crawford's Late, Old Mixon, Free, Stump, Smock Free, Chinese Cling.
PLUMS. Wild Goose, Damson, Green Gage.
*Promising.*—Simoni.
PEARS. Clapp's Favorite, Bartlett, Buffum, Duchess, Flemish Beauty, Beurre d' Anjou, Kieffer, Sheldon, Howell, Lawrence.
CHERRIES. Early May, English Morello.
QUINCES. Orange.
GRAPES. Concord, Ives' Seedling, Brighton, Delaware, Worden, Moore's Early, Clinton.
*Promising.*—Niagara, Empire State, Early Dawn, August Giant.
CURRANTS. Fay's Prolific, White Grape.

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GOOSEBERRIES. Downing, Smith's Improved, Houghton.
BLACKBERRIES. Lawton, Snyder, Taylor, Stone's Hardy.
DEWBERRIES. Wild ones do well.
RASPBERRIES, BLACK. Gregg, Souhegan, Tyler.
RASPBERRIES, RED. Cuthbert.
*Promising.*—Shaffer's Colossal.
STRAWBERRIES. Wilson, Crescent, Charles Downing, Captain Jack, Monarch of the West.

## BENTON COUNTY.

APPLES. *Summer*—Red Astrachan, Early Joe, Early Harvest.
*Fall*—Jeffries.
*White*—Fall Pippin, Fall Wine, Rambo.
*Winter*—Grime's Golden, Janet, Tolman Sweet, Roman Stem, Indiana Favorite (none better), Oxford.
*Crab*—Whitney, Hislop, Quaker Beauty, Transcendent.
PLUMS. Wild Goose, Miner.
PEARS. Kieffer, Osband's Summer, Clapp's Favorite, Bartlett.
CHERRIES. Early May.
GRAPES. Concord, Ives, Niagara, Worden.
CURRANTS. Fays, White Grape, Red Dutch.
GOOSEBERRIES. Houghton, Downing.
BLACKBERRIES. Snyder.
RASPBERRIES, BLACK. Souhegan, Gregg.
RASPBERRIES, RED. Philadelphia, Brandywine.
STRAWBERRIES. Crescent, Cumberland, Sharpless.
*Promising.*—Bubach, Bidwell.

## BOONE COUNTY—TWO REPORTS.

APPLES. *Summer*—Early Harvest, RedJune, Summer Pearmain, Red Astrachan, Red Stripe, Tetofsky.
*Promising.*—Yellow Transparent, Alexander, Duchess of Oldenburg.
*Fall.*—Wealthy, Maiden Blush, Fameuse or Snow, Rambo, Fall Wine.
*Winter.*—Grimes' Golden, White Pippin, Romanstem, Janet, Peck's Pleasant, Rome Beauty, Willow Twig, Vandevere, Ben Davis, Wine Sap, Yellow Bellflower, Clayton.
*Promising.*—Mann, Stark, Walbridge, Indian, Missouri Pippin, Pewaukee.
*Crabs.*—Transcendent, Hyslop.
PEACHES. Alexander, Crawford Early, Foster, Schumaker.
*Promising.*—Early Louise, Roser.
PLUMS. Robinson, Wild Goose, Miner, Bradshaw, Lombard, Damson.
*Promising.*—Marianna, Moore's Arctic, German Prune.
PEARS. Flemish Beauty, Clapp's Favorite, Bartlett, Sheldon, Duchess, Kieffer, Lawrence, Beurre d' Anjou.
*Promising.*—Lawson, Leconte.
CHERRIES. Early May, Montmorency, Late Richmond, English Morello.
*Promising.*—Silver Thorn, Olivet.
QUINCES. Orange, Champion.
GRAPES. Concord, Hartford, Clinton, Ives' Seedling, Moore's Early, Pocklington, Delaware, Niagara.
*Promising.*—Empire State, Vergennes, Worden.

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CURRANTS. Cherry, White Grape.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Houghton, Downing.
*Promising.*—Industry.
BLACKBERRIES. Snyder, Taylor.
*Promising.*—Erie.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Mammoth Cluster, Ohio.
*Promising.*—Wonder, Earhart.
RASPBERRIES, RED. Hansell, Cuthbert.
STRAWBERRIES. Sharpless, Crescent, Cumberland Triumph.
*Promising.*—Logan, Jessie.

## BROWN COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Early Harvest, Benoni, Trenton Early, Summer Queen, Sweet Bough.
*Fall.*—Grimes' Golden, Fall Wine, Rambo, Fall Queen, Maiden Blush, Holland Pippin, Tulpehocken.
*Promising.*—Wealthy.
*Winter.*—Rome Beauty, Black Sweet, Milam, White Winter Pearmain, Janet Big Romanite, Little Romanite, Ben Davis, Winter Rambo, King, Tolman Sweet, Walbridge, Wine Sap, Jersey Black.
*Crabs.*—Hyslop, Transcendent, Hughes.
*Promising.*—Martha.
PEACHES. Crawford Early, Crawford Late, Stump, Early Beatrice, Heath Cling, Honest John, Old Mixon Cling, Old Mixon Free, Heath Free, Steadley.
PLUMS. Wild Goose, Weaver, Damson.
PEARS. Bartlett, Seckel, Flemish Beauty, Duchess, Kieffer.
*Promising.*—Leconte.
CHERRIES. Early May, Black Heart, May Duke, Governor Wood, Late Duke.
*Promising.*—Dye House.
QUINCES. Orange, Champion, Meech's Prolific.
APRICOTS—Peach, Breda.
GRAPES. Concord, Ives' Seedling, Moore's Early, Wilder, Delaware, Martha, Brighton, Pocklington, Hartford.
*Promising.*—Niagara, Worden, Empire State, Elvira.
CURRANTS. Red Dutch, Fay's Prolific, Lee's Prolific.
GOOSEBERRIES. Mountain Seedling, Downing.
BLACKBERRIES. Lawton, Wilson's Early, Snyder, Taylor.
RASPBERRIES, BLACK. Souhegan, Mammoth Cluster, Gregg.
RASPBERRIES, RED. Cuthbert.
STRAWBERRIES. Sharpless, Big Bob, Bidwell, Crescent, Charles Downing.

## CARROLL COUNTY—TWO REPORTS.

APPLES. *Summer.*—Red Astrachan, Red June, Tetofsky, Sops of Wine, Early Harvest.
*Fall.*—Rambo, Maiden Blush, Haas, Fameuse or Snow.
*Winter.*—Ben Davis, White Winter Pearmain, Tolman Sweet, Janet, Grimes' Golden, Rome Beauty, Romanstem, Tulpehocken, Vandevere, Westfield Seek-no-further.

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*Promising.*—Stark, Mann.

*Crabs.*—Whitney No. 20, Marengo, Hyslop, Transcendent.

**Plums.** Wild Goose, Miner, Marianna, Botan (extra fine), Ogan, Newman.

*Promising.*—Pottawattomie, Moore's Arctic, Satsuma or Blood, Robinson, Moorman.

**Pears.** Clapp's Favorite, Seckel, Beurre d' Anjou, Bartlett, Goodale, Sheldon, Duchess, L. B. de Jersey.

*Promising.*—Cole.

**Cherries.** Early Richmond, English Morello, Louie Phillip, Montmorency, May Duke, Olivet.

**Grapes.** Worden, Concord, Delaware.

**Currants.** Fay's Prolific, Raby Castle, Versailles, White Grape.

**Gooseberries.** Champion, Downing, Houghton, Smith's Improved.

**Blackberries.** Snyder, Ancient Briton, Western Triumph, Taylor.

*Promising.* Erie.

**Raspberries, Black.** Souhegan, Davidson, Chapman, Gregg.

*Promising.*—Ada.

**Raspberries, Red.** Shaffer's Colossal, Cuthbert, Turner.

**Strawberries.** Logan, Crescent, Itasca, Glendale, Jersey Queen, Charles Downing.

*Promising.*—Bubach No. 5, Haverland.

## CASS COUNTY—THREE REPORTS.

**Apples.** *Summer.*—Early Harvest, Red Astrachan, Red June, Red Stripe, Sweet June, Summer Queen, Duchess of Oldenburg.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Autumn Strawberry, Fall Queen, Rambo, Fall Wine.

*Promising.*—Wealthy.

*Winter.*—Grimes' Golden, White Pippin, Yellow Bellflower, King, Northern Spy, Rome Beauty, Ben Davis, Smith's Cider, Wine Sap, Willow Twig, Romanstem, Janet, Rhode Island Greening, Dominie.

**Crabs.** Transcendent, Hyslop, Quaker Beauty, Martha, Yellow Siberian, White Arctic.

**Peaches.** Don't succeed; too cold.

**Plums.** Wild Goose, Blue Damson, Weaver, Miner.

*Promising.*—Robinson, Green Gage.

**Pears.**—Bartlett, Clapp's Favorite, Flemish Beauty, Tyson, Seckel, Sheldon, White Doyenne.

**Cherries.** Early Richmond, Late Richmond, Empress Eugenie, Dye House, English Morello.

*Promising.*—Red Jacket, Olive.

**Quinces.** Champion, Orange.

**Grapes.** Concord, Clinton, Moore's Early, Worden, Ive's Seedling, Catawba, Lindley, Wilder, Martha, Delaware.

*Promising.*—Jefferson, Pocklington (slow grower), Prentiss (good.)

**Currants.** Red Dutch, Cherry, Versailles, Fay's Prolific.

**Gooseberries.** Houghton, Downing.

**Blackberries.** Snyder, Agawam, Taylor.

*Promising.*—Early Cluster, Wilson's Early.

**Dewberries.** Lucretia.

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RASPBERRIES, BLACK. Gregg, Souhegan, Ohio, Mammoth Cluster.
RASPBERRIES, RED. Cuthbert, Turner.
STRAWBERRIES. Crescent, Sharpless, Wilson's Albany, Bonanza, Miner's Prolific, Charles Downing, Indiana.

## CLARK COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest.
*Fall.*—Maiden Blush, Porter, Rambo.
*Winter.*—Ben Davis, Rome Beauty, Wine Sap, Smith's Cider, Grimes' Golden, Stark.
*Crabs.*—Hughes, Transcendent.
PEACHES. Amsden, Arkansas Traveler, Heath Free, Stump Free, Old Mixon Free, Old Mixon Cling, Crawford's Early, Crawford's Late, Wheatland, Early Canada.
PEARS. Kieffer, Sheldon, Winter Nellis, Clapp's Favorite, Flemish Beauty.
CHERRIES. Early Richmond, Montmorency, Olivet, Louis Phillip.
GRAPES. Concord, Moore's Early, Worden, Niagara, Hartford, Ives' Seedling.
GOOSEBERRIES. Houghton, Downing.
BLACKBERRIES. Wilson's Early.
RASPBERRIES, BLACK. Gregg.
RASPBERRIES, RED. Cuthbert, Turner.

## CLAY COUNTY—TWO REPORTS.

APPLES. *Summer.*—Yellow June, Early Harvest, Sweet June, Duchess of Oldenburg, Keswick Codlin, Summer Queen.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden Blush, Rambo, Northern Spy, Fall Wine, Fall Pippin.
*Promising.*—Wealthy.
*Winter.*—Ben Davis, Janet, Red Sweet Pippin, Wine Sap, White Winter Pearmain, Milam.
*Crabs.*—Martha, Transcendent, Orange (finest), Hyslop, Walters' Sweet Winter.
PEACHES. Old Mixon Free, Crawford Early, Crawford Late, Snow Cling.
PLUMS. Wild Goose, Robinson, Marianna, Blue Damson.
*Promising.*—Moore's Arctic, German Prune, Shipper's Pride.
PEARS. Howell, Bartlett, Clapp's Favorite, Duchess, Seckel, Beurre d' Anjou, Flemish Beauty, Louie Bonne.
*Promising.*—Kieffer.
CHERRIES. Early May, English Morello.
QUINCES. Do not succeed here.
GRAPES. Concord, Ives' Seedling, Hartford, Worden, Moore's Early, Martha (the best of white grapes.)
*Promising.*—Niagara, Empire State, Pocklington.
CURRANTS. Cherry, White Dutch, Red Dutch.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Mountain Seedling, Houghton.
BLACKBERRIES. Snyder, Taylor.
RASPBERRIES, BLACK. Doolittle, Gregg, Tyler, Shaffer's Colossal.
RASPBERRIES, RED. Turner.

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STRAWBERRIES. Crescent, Kentucky, Windsor Chief, Cumberland Triumph, Sharpless, Miner.
*Promising.*—Haverland.

## CRAWFORD COUNTY.

APPLES. *Summer.*—Early Harvest, Yellow June.
*Fall.*—Rambo, Maiden Blush, Fall Queen.
*Winter.*—Ben Davis, Wine Sap, Rome Beauty, Janet, Smith's Cider, Gilpin, or Little Romanite, Lawver.
*Crabs.*—Hughes.
PLUMS. Wild Goose, Blue Damson, Green Gage.
PEARS. Clapp's Favorite, Osband's Summer, Bartlett, Seckel.
CHERRIES. Early May.
QUINCES. Orange.
GRAPES. Concord.
CURRANTS. White Grape.
RASPBERRIES, BLACK. Gregg.

## DAVIESS COUNTY.

APPLES. *Summer.*—Early Harvest, Red June, Red Astrachan, Benoni.
*Promising.*—Yellow Transparent.
*Fall.*—Grimes' Golden, Maiden Blush, Rambo, Fall Pippin, Tulpehocken, Fall Wine.
*Promising.*—Wealthy.
*Winter.*—Wine Sap, Ben Davis, Rome Beauty, Lady Sweet, Janet, Westfield Seek-no-further, Mann, Jersey Black.
*Promising.*—Stark.
*Crabs.*—Transcendent, Hyslop.
PEACHES. Schumaker, Blood Cling, Heath Cling.
PLUMS. Wild Goose, Blue Damson.
*Promising.*—Robinson, Richland.
PEARS. Bartlett, Duchess.
CHERRIES. Early Richmond, Late Richmond, English Morello, Governor Wood.
QUINCES. Orange.
GRAPES. Concord, Hartford, Worden, Catawba, Delaware.
CURRANTS. Cherry.
GOOSEBERRIES. Mountain Seedling, Houghton.
BLACKBERRIES. Snyder.
*Promising.*—Erie.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Ohio.
RASPBERRIES, RED. Hansell, Shaffer's Colossal.
STRAWBERRIES. Crescent, Sharpless, Miner's Prolific.
*Promising.*—Itasca, Jessie, Logan.

## DECATUR COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Red June, Benoni, Early Strawberry.
*Fall.*—Maiden Blush, Rambo, Tulpehocken, Fall Pippin.
*Winter.*—Rome Beauty, Ben Davis, Smith's Cider, Romanstem, Janet, Grimes' Golden, Indian, Stark, Wine Sap, King.

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*Crabs.*—Transcendent, Hyslop.
*Promising.*—Whitney No. 20.
PLUMS. Robinson, Wild Goose, Damson.
PEARS. Bartlett, Flemish Beauty, Clapp's Favorite, Seckel, Kieffer, L. B. Jersey.
CHERRIES. Early Richmond, Early Purple Guigne, May Duke.
QUINCES. Orange, Rea's Mammoth.
GRAPES. Concord, Ives' Seedling, Delaware, Niagara.
CURRANTS. Cherry, Red Dutch, White Grape,
GOOSEBERRIES. Houghton, Downing.
BLACKBERRIES. Wilson's Early, Kittatinny.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Mammoth Cluster.
RASPBERRIES, RED. Cuthbert, Turner.
STRAWBERRIES. Crescent, Wilson's Albany, May King, Manchester.
*Promising.*—Bubach.

## DEARBORN COUNTY.

APPLES. *Summer.*—Early Harvest, Benoni, Early Strawberry.
*Fall.*—Fall Pippin, Maiden's Blush.
*Winter.*—Ben Davis, Smith's Cider, Wine Sap, Tulpehocken, Rome Beauty.
PEACHES.—Amsden, Alexander, Crawford's Early, Crawford's Late, Old Mixon's Cling, Old Mixon's Free, Heath's Cling, Smock.
PLUMS. Wild Goose.
PEARS. Bartlett, Seckel.
*Promising*—Kieffer.
CHERRIES. Early Richmond, May Duke, Late Duke.
QUINCES. Orange.
GRAPES.—Concord, Ive's Seedling.
*Promising.*—Worden, Moore's Early, Pocklington.
CURRANTS. Red Dutch, Versailles.
BLACKBERRIES. Snyder, Lawton.
RASPBERRIES, BLACK. Tyler, Gregg.
RASPBERRIES, RED. Turner, Cuthbert.
STRAWBERRIES. Crescent, Sharpless, Charles Downing, Manchester, Kentucky.
*Promising.*—Gandy, Ohio, Lida, Bubach.

## DELAWARE COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Red June, Summer Queen, Duchess of Oldenburg.
*Fall.*—Maiden's Blush, Rambo, Fameuse or Snow, Fall Pippin.
*Winter.*—Rome Beauty, Ben Davis, Wine Sap, White Pippin, White Winter Pearmain, Baldwin, Vandevere, Romanstem, Tulpehocken, Smith's Cider, Stark, Walbridge, Clayton.
*Crabs.*—Transcendent, Hyslop.
PLUMS. Wild Goose, Robinson, Damson.
PEARS. Flemish Beauty, Clapp's Favorite, Seckel, Bartlett, Beurre Clairgeau, Duchess, Howell.
*Promising.*—Warner.
CHERRIES. Early Richmond, English Morello.
GRAPES. Concord, Worden, Martha, Niagara.

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CURRANTS. White Dutch, Red Dutch, Versailles.
GOOSEBERRIES. Houghton.
*Promising.*—Champion.
BLACKBERRIES. Snyder, Taylor.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Tyler, Ohio, Doolittle.
RASPBERRIES, RED. Cuthbert, Turner.
*Promising.*—Shaffer's Colossal.
STRAWBERRIES. Crescent, Logan, Bubach, Kentucky, Cumberland Triumph.
*Promising.*—Warfield, Haverland.

## DEKALB COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Red June, Red Astrachan.
*Fall.*—Maiden Blush, Autumn Strawberry, Fameuse or Snow, Fall Pippin, Duchess of Oldenburg.
*Winter.*—Baldwin, Rhode Island Greening, Northern Spy, Peck's Pleasant, Holland Pippin, Pennsylvania Red Streak, Yellow Bellflower, Tolman Sweet, Westfield Seek-no-further, Dominie, Ben Davis.
*Promising.*—Wealthy, Stark, Walbridge, Rubicon.
*Crabs.*—Transcendent, Hyslop.
PLUMS. Green Gage.
PEARS. Bartlett, Kieffer, Clapp's Favorite, Belle Lucrative.
CHERRIES. Early Richmond, English Morello, Ox Heart.
GRAPES. Concord, Salem, Niagara.
CURRANTS. Red Dutch, White Dutch.
BLACKBERRIES. Snyder, Kittatinny.
RASPBERRIES, BLACK. Mammoth Cluster, Tyler, Gregg.
STRAWBERRIES. Wilson's Albany, Sharpless, Crescent, Charles Downing.

## DUBOIS COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Red June, Red Astrachan, Yellow June, Sweet Bough.
*Promising.*—Yellow Transparent.
*Fall.*—Rambo, Tulpehocken, Maiden Blush.
*Promising.*—Haas, Wealthy.
*Winter.*—Wine Sap, Grimes' Golden, Ben Davis, Rome Beauty, Rhode Island Greening, Prior's Red, Willow Twig, Janet, Michael Henry Pippin, Spitzenburg, Limbertwig.
*Promising.*—Mann, Lawver.
*Crabs.*—Transcendent, Hughes.
PEACHES. Amsden, Alexander, Crawford Early, Crawford Late, Old Mixon Free, Heath Cling, Smock, Stump.
PLUMS. Wild Goose, Weaver.
*Promising.*—Marianna, Forest Rose.
PEARS. Bartlett, Flemish Beauty, Louie Bonne, Seckel, Sheldon, Buffum, Howell.
*Promising.*—Kieffer, Leconte.
CHERRIES. Early Richmond, English Morello, May Duke.
QUINCES. Orange, Rea's Mammoth.
GRAPES. Concord, Ives' Seedling, Delaware, Worden, Elvira.
*Promising.*—Pocklington.

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CURRANTS. Red Dutch, Versailles, White Grape, Cherry.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Houghton, Smith's Improved.
*Promising.*—Industry.
RASPBERRIES, BLACK. Gregg.
RASPBERRIES, RED. Cuthbert, Turner.
STRAWBERRIES. Crescent, Sharpless, Manchester, Cumberland Triumph, Bidwell.
*Promising.*—Bubach.

## FAYETTE COUNTY—THREE REPORTS.

APPLES. *Summer.*—Red Astrachan, Early Harvest, Benoni, Early Strawberry, Summer Rambo, Fourth of July.
*Fall.*—Maiden Blush, Fall Pippin, Wealthy, Fall Wine.
*Promising.*—Duchess of Oldenburg.
*Winter.*—White Pippin, Baldwin, King, Milam, Romanstem, Indiana Favorite, Grimes' Golden, Vandevere, Northern Spy, Yellow Bellflower, Rome Beauty, Stark, Mann.
*Crabs.*—Hughes.
PEACHES. Old Mixon Cling, Old Mixon Free, Crawford Early, Crawford Late, Alexander, Heath Cling, Foster, Honest John.
PLUMS. Lombard, Wolf, Imperial Gage, Blue Damson.
PEARS. Bartlett, Flemish Beauty, Duchess, Seckel.
*Promising.*—Kieffer.
CHERRIES. Montmorency, Early Richmond.
GRAPES. Concord, Worden, Wilder, Brighton, Vergennes, Moore's Early, Ive's Seedling.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Miller's Daily, Mammoth Cluster, Souhegan.
RASPBERRIES, RED. Cuthbert.
STRAWBERRIES. Jessie, Cumberland Triumph, Wilson's Albany, May King, Parry, Crescent, Kentucky, Gandy.

## FLOYD COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Early Harvest, Early Strawberry, Red Astrachan.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden Blush, Gravenstein, Rambo, Fall Pippin.
*Promising.*—Duchess of Oldenburg.
*Winter.*—Ben Davis, Rome Beauty, Jonathan, Wine Sap, Stark, Tewksbury Blush, Yellow Bellflower.
*Promising.*—Lawver, Missouri Pippin.
*Crabs.*—Hughes, Hyslop, Tetofsky.
PEACHES. Old Mixon Free, Old Mixon Cling, Amsden, Crawford Early, Yellow Rareripe, Heath Cling, Crawford Late, Stump, Large Orange, Heath Free.
PLUMS. Blue Damson, Yellow Egg, Lombard, German Prune, Wild Goose, Robinson.
PEARS. Flemish Beauty, Bartlett, Seckel, Beurre d' Anjou, Duchess.
*Promising.*—Kieffer.
CHERRIES. Elton, Early Richmond, Governor Wood, Dye House.
QUINCES. Orange.

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GRAPES. Concord, Hartford, Norton's Virginia, Elvira, Catawba, Martha.
*Promising.*—Moore's Early, Pocklington, Moore's Diamond, Brighton, Early Victor.
CURRANTS. Red Dutch, Fay's Prolific, Cherry.
GOOSEBERRIES. Downing, Houghton.
BLACKBERRIES. Snyder, Taylor, Stone's Hardy, Ancient Briton.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK.—Miami or Mammoth Cluster, Souhegan, Doolittle, Gregg.
RASPBERRIES, RED.—Cuthbert, Turner.
STRAWBERRIES. Charles Downing, Crescent, Kentucky, Cumberland Triumph, Manchester, Glendale.

## FOUNTAIN COUNTY.

APPLES. *Summer.*—Summer Queen, Sweet Bough, Red Astrachan, Early Harvest.
*Fall.*—Maiden Blush, Duchess of Oldenburg, Wealthy.
*Winter.*—Ben Davis, Janet, Newtown Pippin, American Pippin or Grindstone, Wine Sap, Rhode Island Greening, Rox Russett.
*Crabs.*—Hyslop, Transcendent, Whitney.
PLUMS. Blue Damson, Wild Goose.
PEARS. Bartlett, Flemish Beauty, Clapp's Favorite.
CHERRIES Early Richmond, May Duke.
GRAPES. Concord, Isabella, Catawba, Niagara.
CURRANTS. Cherry, Versailles, White Grape.
GOOSEBERRIES, Overcome by mildew and worms.
RASPBERRIES, BLACK. Ohio. Wild ones succeed the best.
RASPBERRIES, RED. Antwerp.
STRAWBERRIES. Captain Jack.

## FRANKLIN COUNTY.—TWO REPORTS.

APPLES. *Summer*—Early Harvest, Sweet Bough, Summer Queen, Red Astrachan, Trenton Early, Benoni, Tetofsky.
*Fall.*—Maiden Blush, Rambo, Fall Pippin, Sops of Wine, Tulpehocken.
*Winter.*—Ben Davis, Rome Beauty, Wine Sap, White Pippin, Romanstem, Grimes' Golden, Indiana Favorite, Jersey Black, Smith's Cider, American Pippin, or Grindstone.
*Promising.*—Shockley.
*Crabs.*—Hughes, Hyslop, Transcendent.
PEACHES. Crawford Early, Crawford Late, Smock, Amsden, Early Beatrice.
PLUMS. Damson, Wild Goose, Green Gage.
PEARS. Osband's Summer, Seckel, Clapp's Favorite, Bartlett, Flemish Beauty, Beurre d' Anjou, Duchess, Kieffer.
CHERRIES. Early Richmond, English Morello, May Duke.
QUINCES. Orange.
GRAPES. Hartford, Ives' Seedling, Moore's Early, Salem, Agawam, Martha, Norton's Virginia, Delaware.
CURRANTS. Cherry, White Grape.
GOOSEBERRIES. Houghton.
STRAWBERRIES. Crescent, Cumberland.



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## GIBSON COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Early Harvest, Red June, Red Astrachan, Benoni, Yellow June.

*Promising.*—Tetofsky.

*Fall.*—Maiden Blush, Rambo, Grimes' Golden, Tulpehocken, Fall Pippin, Fall Wine.

*Winter.*—Wine Sap, Rome Beauty, Ben Davis, Gilpin, Willow Twig, Wiley Sweet, Northern Spy, Smith's Cider, Jersey Black, Fink.

*Promising.*—Missouri Pippin.

*Crabs.*—Transcendent, Hughes.

PEACHES. Crawford Early, Crawford Late, Old Mixon Free, Stump, Blood Cling.

PLUMS. Wild Goose, Robinson, Blue Damson, Weaver.

PEARS. Bartlett, Duchess, Kieffer, Seckel, Howell, Tyson, Beurre d' Anjou.

CHERRIES. Early May, May Duke, Governor Wood, Montmorency, Dye House.

QUINCES. Orange, Champion.

*Promising.* Meech's Prolific.

GRAPES. Concord, Moore's Early, Worden, Delaware, Duchess, Niagara, Isabella.

*Promising.*—Brighton, Pocklington, Jefferson, Agawam.

CURRANTS. Red Dutch, Versailles, Fay's Prolific, White Grape.

GOOSEBERRIES. Houghton, Smith's Improved, Downing, Industry.

BLACKBERRIES. Snyder, Taylor, Wilson's Early.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Tyler, Ohio.

RASPBERRIES, RED. Cuthbert, Golden Queen.

STRAWBERRIES. Crescent, Cumberland Triumph, Sharpless, Kentucky, Wilson's Albany.

## GRANT COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Red Astrachan, Early Harvest, Trenton Early, Red June.

*Promising.*—Yellow Transparent.

*Fall.*—Duchess of Oldenburg, Maiden Blush, Fall Orange, Rambo.

*Promising.*—Wealthy.

*Winter.*—Ben Davis, Grimes' Golden, Baldwin, Smith's Cider, White Pippin, Romanstem, Winesap, Northern Spy, Jersey Black, Jonathan, Lawver, Mann.

*Crabs.*—Hyslop, Transcendent, Whitney No. 20, General Grant.

PEACHES. Early Crawford, Foster, Heath Cling, Stump, Crawford Late, Old Mixon Cling; Wager, not reliable.

PLUMS. Robinson, Blue Damson, Wild Goose, Miner, Lombard, Weaver.

*Promising.*—German Prune, Moore's Arctic.

PEARS. Bartlett, Flemish Beauty, Clapp's Favorite, Beurre d' Anjou, Kieffer.

*Promising.*—Warner, Leconte, Lawson.

CHERRIES. Early May, Montmorency, Louie Phillip, English Morello, Olivet Dye House.

QUINCES. Orange, Champion.

GRAPES. Concord, Worden, Wilder, Lady, Ive's Seedling, Pocklington, Moore's Early, Washington, Brighton.

CURRANTS. Red Dutch, White Dutch, Cherry, Victoria.

*Promising.*—Fay's Prolific.

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GOOSEBERRIES. Houghton, Downing, Smith's Improved.
BLACKBERRIES. Snyder, Taylor, Wilson's Early.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Mammoth Cluster, Tyler.
RASPBERRIES, RED. Shaffer's Colossal, Turner, Marlboro.
STRAWBERRIES. Crescent, Cumberland Triumph, Wilson's Albany, Manchester, Jewell, Sharpless.
*Promising.*—Jessie, Bubach.

## GREENE COUNTY—SEVEN REPORTS.

APPLES. *Summer.*—Early Harvest, Red June, Red Astrachan, Benoni, English Codlin, Horse.
*Promising.*—Yellow Transparent, Tetofsky.
*Fall.*—Maiden Blush, Rambo, Fall Wine, Fall Pippin, Wealthy.
*Winter.*—Ben Davis, Wine Sap, Smith's Cider, Rome Beauty, Grimes' Golden, Limbertwig, Janet, Willow Twig, Indiana Favorite, Gilpin, Stark.
*Promising.*—Indian, Mann, McLaughlin's Keeper, Chronicle, Salome.
*Crabs.*—Hyslop, Whitney No. 20, Transcendent.
*Promising.*—Martha, Quaker Beauty.
PEACHES. Alexander, Crawford's Early, Amsden, Heath Cling, Stump, Foster, Blood Cling.
PLUMS. Wild Goose, Blue Damson, Robinson, Weaver, German Prune, Lombard.
*Promising.*—Marianna, Imperial Gage.
PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Kieffer, Tyson, Duchess, Seckel, Sheldon.
CHERRIES. Early May, English Morello
*Promising.*—Dye House, Montmorency.
QUINCES. Orange, Rea's Mammoth, Champion.
GRAPES. Concord, Ives' Seedling, Delaware, Pocklington, Worden, Moore's Early, Hartford, Brighton, Martha.
*Promising.*—Vergennes, Niagara, Woodruff Red.
CURRANTS. White Grape, Cherry, Versailles, Red Dutch.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Downing, Smith's Improved, Mountain Seedling.
BLACKBERRIES. Snyder, Wachusetts.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Souhegan, Mammoth Cluster.
*Promising.*—Earhart.
RASPBERRIES, RED. Turner, Marlboro, Shaffer.
STRAWBERRIES. Crescent, Cumberland Triumph, Sharpless, Kentucky, Bidwell, Windsor Chief, Iron Clad.

## HAMILTON COUNTY—FIVE REPORTS.

APPLES *Summer.*—Red Astrachan, Early Harvest, Kirkbridge White, Early Strawberry, Golden Sweet, Tetofsky.
*Promising.*—Yellow Transparent, Duchess of Oldenburg.
*Fall.*—Maiden's Blush, Rambo, Fameuse or Snow, Wealthy, Fall Orange, Cain.
*Promising.*—Haas.
*Winter.*—Ben Davis, Grimes' Golden, Indiana Favorite, Rome Beauty, Stark, Roman Stem, White Pippin, Willow Twig, Red Sweet Pippin, Tolman's Sweet.

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*Promising.*—Walbridge, Tulpehocken.

*Crabs.*—Whitney No. 20, Transcendent, Hyslop.

PLUMS. Wild Goose, Miner, Robinson, Blue Damson, German Prune.

*Promising.*—Sanders' October, Lombard.

PEARS. Clapp's Favorite, Flemish Beauty, Kieffer, Lawrence, Osband's Summer, Bartlett, Duchess, Beurre d' Anjou, Doyenne Boussock, Seckel, Dana's Hovey.

CHERRIES. Early Richmond, English Morello, Louis Phillip.

*Promising.*—Dye House, Montmorency.

QUINCES. Champion.

GRAPES. Concord, Moore's Early, Worden, Brighton, Niagara, Pocklington, Wilder, Ives' Seedling, Martha, Ulster Prolific, Elvira.

*Promising.*—Wyoming Red, Lindley.

CURRANTS. Red Dutch, Knight's Sweet Red, White Grape, Cherry, Black Naples.

*Promising.*—Fay's Prolific, Lee's Prolific.

GOOSEBERRIES. Houghton, Downing, Mountain Seedling.

*Promising.*—Industry.

BLACKBERRIES. Taylor, Snyder, Kittatinny, Lawton.

*Promising.*—Minnewashka.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Souhegan, Ohio, Gregg, Doolittle, Mammoth Cluster.

RASPBERRIES, RED. Cuthbert, Turner, Shaffer's Colossal.

STRAWBERRIES. Miner's Prolific, Crescent, Sharpless, Charles Downing.

*Promising.*—Jessie, Bubach.

## HANCOCK COUNTY—THREE REPORTS.

APPLES. *Summer.*—Red Astrachan, Early Harvest, Red June, Benoni, Summer Queen.

*Promising.*—Yellow Transparent, Tetofsky.

*Fall.*—Maiden Blush, Duchess of Oldenburg, Rambo, Fall Wine, Fameuse or Snow, Fall Pippin.

*Promising.*—Haas.

*Winter.*—Rome Beauty, Ben Davis, Smith's Cider, Vandevere, Wine Sap, Baldwin, White Winter Pearmain, Wagoner, Romanstem, Newtown Pippin, White Pippin.

*Promising.*—Wealthy, Walbridge, Mann.

*Crabs.*—Transcendent, Hyslop.

*Promising.*—Whitney No. 20, Quaker Beauty.

PEACHES. Amsden, Crawford Early, Crawford Late, Alexander, Foster.

*Promising.*—Patterson's Seedling.

PLUMS. Lombard, German Prune, Wild Goose, Bradshaw, Green Gage.

*Promising.*—Moore's Arctic, Robinson.

PEARS. Bartlett, Clapp's Favorite, Osband's Summer, Flemish Beauty, Seckel, Sheldon, Duchess, L. B. Jersey.

*Promising.*—Kieffer.

CHERRIES. Early May, Montmorency, Rein Hortense, English Morello, May Duke.

*Promising.*—Louie Phillip, Dye House, Olivet.

QUINCES. Orange.

*Promising.*—Champion.

GRAPES. Concord, Worden, Moore's Early, Ives, Martha, Elvira, Niagara, Delaware, Vergennes.

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*Promising.*—Pocklington, Mary's Favorite, Prentiss, Salem.

RASPBERRIES, BLACK. Gregg, Mammoth Cluster, Souhegan, Doolittle.

*Promising.*—Ohio.

RASPBERRIES, RED. Cuthbert, Turner.

STRAWBERRIES. Crescent, May King, Piper, Bidwell, Sharpless, Cumberland Triumph, Mt. Vernon.

*Promising.*—Warfield, Haverland, Bubach, Logan, Jessie.

## HARRISON COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Early Harvest, Early Strawberry, American Summer Pearmain, Summer Rose, Gravenstein, Benoni, Summer Rambo, Sweet Bough.

*Fall*—Maiden Blush, Twenty Ounce, Tulpehocken, Grimes' Golden, Holland Pippin, Rambo, Fall Pippin.

*Winter.*—Ben Davis, Rome Beauty, Wine Sap, Smith's Cider, Yellow Bellflower, Pennsylvania Red Streak, Lawver, Red Sweet Pippin, Nickajack, Spitzenburg, Lansingburg.

*Promising.*—Indian, Jonathan, Missouri Pippin.

*Crabs.*—Hughes.

PEACHES. Amsden, Hale's Early, Heath Cling, Troth's Early, Mountain Rose, George the Fourth, Crawford Early, Crawford Late. Early York, Old Mixon Cling, Old Mixon Free, Honest John, Foster, Stump, Schumaker, Ward's Late.

PLUMS. Wild Goose, Weaver, Blue Damson, Green Gage, Miner.

PEARS. Bartlett, Duchess, Flemish Beauty, Beurre d' Anjou, Clapp's Favorite, Beurre Clarigeau, Beurre Easter, Lawrence, Seckel, L. B. Jersey, Winter Nellis, Leconte.

CHERRIES. Early Richmond, May Duke, Olivet, Governor Wood, Empress Eugenie, Black Heart.

QUINCES. Orange, Angers.

GRAPES. Concord, Ives Seedling, Hartford, Elvira, Niagara, Empire State, Catawba, Isabella, Lady Washington, Alvey.

CURRANTS. Red Dutch, Cherry.

GOOSEBERRIES. Downing.

BLACKBERRIES. Wilson.

RASPBERRIES, BLACK. Mammoth Cluster.

STRAWBERRIES. Charles Downing, Kentucky, Wilson's Albany.

## HENDRICKS COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Benoni, Early Harvest, Red Astrachan, Red Stripe, Summer Rose, Sweet Bough, Kirkbridge White.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Fall Wine, Rambo, Duchess of Oldenburg, Wealthy.

*Promising.*—Sweet Bellflower.

*Winter.*—Ben Davis, White Pippin, Grimes' Golden, Clayton, Moore's Sweet or Red Sweet Pippin, Roman Stem, Rome Beauty, Smith's Cider (tree tender), American Pippin or Grind Stone (long keeper), Seed Favorite, Jarminite, Lansingburg (long keeper), Tulpehocken.

*Promising.*—Pewaukee, Stark, York Imperial.

*Crabs.*—Transcendent, Whitney No. 20, Hyslop.

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PEACHES. Amsden, Early York, Early Crawford, Late Crawford, Heath Cling, Old Mixon Cling, Roser, Stump, Smock, Troth's Early, President. Peaches not a reliable crop.

PLUMS. Wild Goose, Robinson, Blue Damson, Miner, Lombard, Imperial Gage, Washington, German Prune.

*Promising.*—Moore's Arctic, Wolf, Hawkeye.

PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Kieffer, Belle Lucrative, Sheldon, Seckel, Tyson, Lawrence, Howell.

*Promising.*—Garber, Mt. Vernon.

CHERRIES. Early Richmond.

*Promising.*—Montmorency, Ostheim, Dye House.

QUINCES. Orange, Champion.

GRAPES. Concord, Ives' Seedling, Moore's Early, Worden, Niagara, Clinton, Delaware, Champion, Lady.

*Promising.*—Brighton, Woodruff Red.

CURRANTS. Red Dutch, White Grape.

*Promising.*—Fay's Prolific, Moore's Ruby.

GOOSEBERRIES. Downing, Houghton, Mountain Seedling.

*Promising.*—Champion.

BLACKBERRIES. Snyder, Taylor, Lawton, Stone's Hardy, Ancient Briton.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Ohio, Souhegan, Mammoth Cluster, Miller's Daily.

*Promising.*—Nemaha, Hilborn.

RASPBERRIES, RED. Turner, Shaffer's Colossal, Cuthbert.

STRAWBERRIES. Crescent, Cumberland Triumph, Warfield, Bubach, Logan, Kentucky.

*Promising.*—Hattie Jones, Haverland.

## HENRY COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, American Summer Pearmain, Summer Queen, Trenton Early.

*Promising.*—Duchess of Oldenburg, Tetofsky.

*Fall.*—Maiden Blush, Rambo, Wealthy, Fall Wine, Fall Pippin, Keswick Codlin, Gabriel.

*Promising.*—Haas.

*Winter.*—Ben Davis, White Pippin, Rome Beauty, Vandevere, Dominie, Jonathan, Grimes' Golden, King, Wine Sap, Yellow Bellflower, Romanstem, Baldwin, Jersey Black, Tolman Sweet, Tulpehocken.

*Promising.*—Stark, Missouri Pippin.

*Crabs.*—Whitney No. 20, Transcendent, Hyslop, Quaker Beauty, Hughes.

PEACHES. Amsden, Crawford Early, Crawford Late, Hill Home Chief, Old Mixon Cling, Old Mixon Free, Alexander, Honest John, Foster, Stump, Heath Cling, Wheatland, Grosse Mignonne. Crop uncertain.

PLUMS. Robinson, Blue Damson, Lombard, Wild Goose.

*Promising.*—Marianna, Kelsey's Japan.

PEARS. Flemish Beauty, Bartlett, Clapp's Favorite, Kieffer, Sheldon, Duchess, Seckel, Beurre d' Anjou, Buffum, Vicar.

*Promising.*—Garber, Warner.

CHERRIES. Early Richmond, English Morello, Montmorency, Dye House, Governor Wood (tender), May Duke.

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QUINCES. Orange, Champion.

GRAPES Concord, Moore's Early, Hartford, Clinton, Delaware, Pocklington, Ives' Seedling, Lady, Niagara, Salem, Martha.

*Promising.*—Empire State, Wyoming Red, Moore's Diamond, Lindley.

CURRANTS. Red Dutch, White Grape, Cherry, White Dutch.

*Promising.*—Fay's Prolific.

GOOSEBERRIES. Downing, Houghton, Smith's Improved, Mountain Seedling.

*Promising.*—Industry.

BLACKBERRIES. Snyder, Taylor, Wilson, Early Harvest.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Mammoth Cluster, Souhegan, Ohio, Davidson's Thornless.

RASPBERRIES, RED. Cuthbert, Turner, Rancocas, Marlboro, Shaffer's Colossal.

STRAWBERRIES. Crescent, Cumberland Triumph, Kentucky, Bubach, Green's Prolific, Mt. Vernon.

*Promising.*—Jessie, Belmont, Monmouth.

## HUNTINGTON COUNTY.

APPLES. *Summer.*—Benoni, Early Harvest, Red Astrachan, Red June.

*Fall.*—Fall Pippin, Maiden Blush, Rambo.

*Winter*—Baldwin, Northern Spy, English Russet, Wine Sap, Ben Davis, American Golden Russet, Rhode Island Greening.

*Crabs.*—Transcendent, Hughes.

PEACHES. Early Canada.

PLUMS. Blue Damson.

*Promising.*—Botan, Ogan, Prunus Simoni.

PEARS. Clapp's Favorite, Flemish Beauty, Blood Good, L. B. Jersey, Seckel.

CHERRIES Early Richmond, English Morello.

GRAPES. Concord, Worden, Brighton, Empire State, Catawba.

CURRANTS. Fay's Prolific, Red Dutch, White Grape.

GOOSEBERRIES. Downing, Industry.

DEWBERRIES. Lucretia.

RASPBEPRIES, BLACK. Gregg.

RASPBERRIES, RED. Cuthbert.

STRAWBERRIES. Jessie, Bubach, Cumberland Triumph, Sharpless, Crescent.

## JACKSON COUNTY—TWO RFPORTS.

APPLES. *Summer.*—Early Harvest, Summer Rambo, Benoni.

*Promising.*—Yellow Transparent.

*Fall.*—Jersey Sweeting, Maiden Blush, Rambo, Wealthy, Twenty Ounce Vandevere.

*Winter.*—Rome Beauty, Baldwin, Dominie, Newtown Pippin, American Golden Russett, Wine Sap, Ben Davis, Grimes' Golden, Willow Twig.

*Crabs.*—Hughes, Whitney, Transcendent.

PEACHES. Alexander, Hale's Early, Crawford's Early, Crawford's Late, Heath Cling, Heath Free, Fleenor, Smock, Stump, Troth's Early, Wheatland.

PLUMS. Blue Damson, Washington, Green Gage, German Prune, Shropshire Damson, Lombard.

PEARS. Bartlett, Kieffer.

CHERRIES. Early Richmond, May Duke, Montmorency.

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QUINCES. Orange, Champion.
APRICOTS. Peach, Early Golden.
GRAPES. Concord, Ive's Seedling, Catawba, Clinton.
CURRANTS. Cherry, White Grape.
GOOSEBERRIES. Houghton, Downing.
BLACKBERRIES. Early Harvest, Kittatinny.
RASPBERRIES, BLACK. Gregg.
RASPBERRIES, RED. Brandywine, Golden Queen.
STRAWBERRIES. Sharpless, Charles Downing.

## JASPER COUNTY—TWO REPORTS.

APPLES. *Summer.*—Red Astrachan, Duchess of Oldenburg, Early Harvest, Benoni.
*Fall.*—Maiden's Blush, Wealthy, Fall Wine, Rambo.
*Winter.*—Willow Twig, Yellow Bellflower, Northern Spy, Janet, Wine Sap, Tolman's Sweet, White Winter Pearmain, Baldwin, Roxbury Russet, Ben Davis.
*Crabs.*—Transcendent, Hyslop, Whitney No. 20.
PLUMS. Wild Goose, Weaver, Miner.
CHERRIES. Early Richmond.
GRAPES. Concord.
RASPBERRIES, BLACK. Gregg, Doolittle, Mammoth Cluster.
RASPBERRIES, RED. Cuthbert, Turner.
STRAWBERRIES. Crescent, Wilson's Albany, Sharpless, Russell's Prolific.

## JEFFERSON COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Early Harvest, Benoni, Red Astrachan, Red June, Summer Queen, Sweet Bough, Golden Sweet.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden's Blush, Fall Pippin, Rambo, Porter.
*Winter.*—Ben Davis, York Imperial, Rome Beauty, Wine Sap, Grimes' Golden, American Golden Russet, Tolman's Sweet, Janet, Milam, King, Tulpehocken, Lansingburg, Smith's Cider.
*Crabs.*—Hyslop, Transcendent, Hughes.
PEACHES. Alexander, Hale's Early, Crawford's Early, Crawford's Late, Heath's Cling, Stump, Old Mixon Free, Henrietta.
PLUMS. Blue Damson, Wild Goose.
PEARS. Bartlett, Flemish Beauty, Clapp's Favorite, Seckel, Kieffer, Howell, Summer Doyenne.
CHERRIES. Early May, May Duke, English Morello.
QUINCES. Orange.
GRAPES. Concord, Moore's Early, Hartford, Worden, Ives' Seedling, Brighton, Catawba, Martha, Delaware, Niagara.
CURRANTS. Red Dutch, White Grape.
GOOSEBERRIES. Houghton, Industry.
BLACKBERRIES. Snyder, Lawton, Wilson, Kittatinny (fine, but rusts badly), Early Harvest.
RASPBERRIES, BLACK. Mammoth Cluster, Gregg, Doolittle.
RASPBERRIES, RED. Cuthbert, Turner.
STRAWBERRIES. Crescent, Wilson's Albany, Charles Downing, Kentucky, Miner's Prolific.

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## JENNINGS COUNTY.

APPLES. *Summer.*—Chenango, Benoni, Early Harvest.
*Fall.*—Rambo, Maiden's Blush, Wealthy.
*Winter.*—Wine Sap, Ben Davis, Johnson Red, Stark, Grimes' Golden, Willow Twig, Janet.
*Crabs.*—Whitney, Hyslop.
PLUMS. Wild Goose, Blue Damson, Lombard.
*Promising.*—Robinson.
PEARS. Bartlett, Clapp's Favorite Flemish Beauty.
*Promising.*—Kieffer.
CHERRIES. Early Richmond, May Duke, Governor Wood.
QUINCES. Orange.
GRAPES. Concord, Ives, Hagin.
CURRANTS. Cherry, White Grape.
*Promising.*—Fay's.
GOOSEBERRIES. Downing, Houghton.
BLACKBERRIES. Snyder.
RASPBERRIES, BLACK. Souhegan, Mammoth Cluster, Gregg.
RASPBERRIES, RED. Turner, Cuthbert.
STRAWBERRIES. Crescent, Sharpless.

## JOHNSON COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Red June, Early Strawberry, Benoni.
*Promising.*—Yellow Transparent, Duchess of Oldenburg.
*Fall.*—Maiden Blush, Rambo, Fall Pippin.
*Promising.*—Haas, Wealthy.
*Winter.*—Grimes' Golden, Rome Beauty, White Pippin, Ben Davis, Tulpehocken, Newtown Pippin, Baldwin, Northern Spy, Yellow Bellflower, Peck's Pleasant, King, Red Sweet Pippin, Smith's Cider, Esopus Spitzenburg, Wine Sap.
*Promising.*—Walbridge.
*Crabs.*—Whitney, Hyslop, Hughes.
PEACHES. Crawford Early, Amsden, Heath Cling, Old Mixon Free, Old Mixon Cling, Troth's Early, Stump.
PLUMS. Green Gage, Miner, Blue Damson, Lombard, Wild Goose, Marianna, Robinson.
*Promising.*—Shipper's Pride, Moore's Arctic.
PEARS. Bartlett, Flemish Beauty, Seckel, Clapp's Favorite, Sheldon, Tyson.
*Promising.*—Kieffer.
CHERRIES. Early Richmond, English Morello, Black, Black Tartarian, Montmorency, Governor Wood.
QUINCES. Orange.
GRAPES. Concord, Delaware, Ives' Seedling, Clinton, Niagara, Catawba, Hartford.
*Promising.*—Pocklington, Salem.
CURRANTS. Red Dutch.
BLACKBERRIES. Snyder, Taylor.
DEWBERRIES. Lucretia.

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RASPBERRIES, BLACK. Gregg, Doolittle, Miami or Mammoth Cluster.
RASPBERRIES, RED. Cuthbert.
STRAWBERRIES. Crescent, Cumberland Triumph, Glendale, Kentucky, Green's Prolific.

## KNOX COUNTY.

APPLES. *Summer.*—Early Harvest, Benoni, Red June, Red Astrachan.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden Blush, Fall Wine.
*Promising.*—Wealthy.
*Winter.*—Wine Sap, Rome Beauty, Ben Davis, Grimes' Golden, Jonathan, Jersey Black, Willow Twig, Lawver.
*Crabs.*—Kentucky Red, Hughes, Transcendent, Whitney No. 20.
PEACHES. Alexander, Troth's Early, Crawford Early, Chinese Cling, Stump, Old Mixon Free, Heath Cling.
*Promising.*—Thurber.
PLUMS. Shropshire Damson, Wild Goose, Miner.
PEARS. Bartlett, Seckel, Duchess, Flemish Beauty.
*Promising.*—Kieffer, Garber, Leconte.
CHERRIES. Early Richmond, English Morello.
*Promising.*—Dye House, Montmorency.
QUINCES. Orange, Champion.
GRAPES. Concord, Worden, Ives' Seedling, Delaware, Martha.
*Promising.*—Niagara, Moore's Early.
CURRANTS. Cherry, Red Dutch, White Grape, White Dutch.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Downing, Houghton.
*Promising.*—Industry.
BLACKBERRIES. Snyder, Lawton, Early Harvest.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Ohio, Souhegan, Gregg.
RASPBERRIES, RED. Turner.
STRAWBERRIES. Crescent, Sucker State.
*Promising.*—Warfield.

## KOSCIUSKO COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Red Astrachan, Early Harvest, Red June, Keswick Codlin, Sweet Bough, Tetofsky.
*Fall.*—Autumn Strawberry, Fall Pippin, Maiden Blush, Twenty Ounce, Duchess of Oldenburg, Alexander, Rambo.
*Winter.*—Baldwin, Ben Davis, Stark, Lawver, Mann, Rhode Island Greening, Yellow Bellflower, Northern Spy, Roxbury Russet, Wine Sap.
*Crabs.*—Hyslop, Transcendent, Soulard.
PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Duchess, Howell, Beurre d' Anjou, Seckel, Kieffer.
CHERRIES. Early Richmond, Governor Wood, May Duke, English Morello, Montmorency.
QUINCES. Orange.
GRAPES. Concord, Worden, Hartford, Martha.
*Promising.*—Niagara, Pocklington.
CURRANTS. Cherry, Red Dutch, Fay's Prolific, White Grape, Victoria.

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GOOSEBERRIES. Downing, Houghton, Smith's Improved.
BLACKBERRIES. Snyder, Taylor, Early Harvest.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Souhegan, Ohio.
RASPBERRIES, RED. Cuthbert, Hansell, Turner, Marlboro.
STRAWBERRIES. Crescent, Windsor Chief, Cumberland Triumph, Manchester, Kentucky, Bubach, Jessie, Gandy.

## LAGRANGE COUNTY.

APPLES. *Summer.*—Red Astrachan, Early Strawberry.
*Fall.*—Maiden Blush, Fameuse or Snow, Rambo, Fall Pippin, Duchess of Oldenburg.
*Promising.*—Wealthy.
*Winter.*—Baldwin, Lawver, Northern Spy, Tulpehocken, Rhode Island Greening, Grimes' Golden, King, American Golden Russet, Vandevere.
PEACHES. *Promising.*—Roser.
PLUMS. Wild Goose, Robinson.
PEARS. Bartlett, Clapp's Favorite, Flemish Beauty.
CHERRIES. Early Richmond.
QUINCES. All varieties succeed.
GRAPES. Brighton, Worden, Concord, Moore's Early, Vergennes.
CURRANTS. Fay's Prolific, White Grape.
GOOSEBERRIES. Smith's Improved, Downing.
RASPBERRIES, BLACK. Mammoth Cluster, Souhegan, Gregg, Nemaha.
RASPBERRIES, RED. Cuthbert.
STRAWBERRIES. Haverland, Bubach, Cumberland Triumph, Crescent, Kentucky.

## LAKE COUNTY.

APPLES. *Summer.*—Chenango, Early Strawberry, Golden Sweet, Sweet Bough.
*Fall.*—Autumn Strawberry, Rambo, Jersey Sweeting.
*Winter.*—Baldwin, American Golden Russett, Roxbury Russett, Northern Spy, King, Tulpehocken, Wagoner.
*Crabs.*—Hesper Rose, Van Wyck (sweet).
PEACHES. Conkling, Early Louise, Crawford Late, Salway, Stump.
PLUMS. Bradshaw, General Hand, Jefferson, Lombard.
*Promising.*—Yellow Egg.
PEARS. Bartlett, Osband's Summer, Tyson, Sheldon, Seckel.
CHERRIES. Yellow Spanish, Black Eagle, Early Richmond, May Duke, Elton, Black Heart.
QUINCES. Champion, Orange.
APRICOTS. Early Golden, Royal, Large Early, Moorpark.
GRAPES. Concord, Delaware, Hartford, Champion, Iona.
CURRANTS. Cherry, Black Naples, Victoria, White Grape.
GOOSEBERRIES.—Downing, Houghton, Crown Bob.
BLACKBERRIES. Taylor, Snyder, Wilson's Early, Early Harvest.
RASPBERRIES, BLACK. Ohio, Gregg.
RASPBERRIES, RED. Cuthbert.
STRAWBERRIES. Bidwell, James Vick, Charles Downing.

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## LAWRENCE COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Early Harvest, Benoni, Red June, Golden Sweet, Chenango, Red Stripe, American Summer Pearmain.

*Promising.*—Yellow Transparent, Duchess of Oldenburg.

*Fall.*—Maiden Blush, Rambo, Fall Wine, Tulpehocken, Fall Pippin, Keswick Codlin.

*Promising.*—Twenty Ounce.

*Winter.*—Grimes' Golden, Rome Beauty, Ben Davis, Wine Sap, Smith's Cider, Indian, Janet, White Pippin, Alma Sweet, Roxbury Russet, Red Sweet Pippin.

*Promising.*—Jonathan, Mann, Lawver, Lansingburg, General Lyon.

*Crabs.*—Kentucky Red, Transcendent, Hyslop, Whitney No. 20.

PEACHES. Old Mixon Free, Heath Cling, Smock, Stump, Old Mixon Cling, Fleenor, Honest John, Crawford Early, Crawford Late, Foster.

*Promising* —Waterloo, Alexander, Salway, Steadley, Ward's Late, Globe.

PLUMS. Blue Damson, Wild Goose, German Prune, Lombard.

*Promising.* Prunus Simoni, Marianna.

PEARS. Clapp's Favorite, Bartlett, Flemish Beauty, Duchess, Kieffer, Seckel, Vicar.

CHERRIES. Early May, May Duke, Black Tartarian, Governor Wood.

*Promising.*—Montmorency, Dye House, Olivet.

QUINCES. Orange, Rea's Mammoth.

*Promising.*—Champion.

GRAPES. Concord, Moore's Early, Niagara, Catawba, Pocklington, Delaware, Martha, Brighton, Prentiss.

CURRANTS. Red Dutch, White Grape.

*Promising.*—Fay's Prolific.

GOOSEBERRIES. Downing, Houghton, Mountain Seedling.

BLACKBERRIES. Snyder, Kittatinny.

RASPBERRIES, BLACK. Gregg, Tyler, Mammoth Cluster, Ohio.

RASPBERRIES, RED. Cuthbert, Turner.

STRAWBERRIES. Crescent, Manchester, Kentucky.

*Promising.*—Bubach, Jessie.

## MARTIN COUNTY.

APPLES. *Summer.*—Benoni, Early Harvest, Red Stripe, Golden Sweet, Red Astrachan.

*Promising.*—Yellow Transparent, Duchess of Oldenburg.

*Fall.*—Maiden Blush, Rambo, Fall Queen, Fall Wine, Tulpehocken, Wealthy, Twenty Ounce.

*Winter.*—Grimes' Golden, Rome Beauty, Ben Davis, Wine Sap, Smith's Cider, Janet, Willow Twig, Lansingburg, Red Sweet Pippin, Limber Twig.

*Crabs.*—Whitney, Transcendent.

PEACHES. Alexander, Troth's Early, Early Crawford, Late Crawford, Old Mixon Free, Old Mixon Cling, Stump, Smock, Heath Cling.

PLUMS. Blue Damson, Wild Goose, Miner, Lombard, German Prune.

PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Duchess, Kieffer, Seckel.

CHERRIES. Early May, May Duke, Montmorency, Governor Wood.

QUINCES. Orange, Champion.

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GRAPES. Concord, Moore's Early, Worden, Ives, Brighton, Pocklington, Niagara, Martha.
CURRANTS. Red Dutch, Fay's, White Grape.
GOOSEBERRIES. Downing, Houghton.
BLACKBERRIES. Snyder, Taylor.
RASPBERRIES, BLACK. Gregg, Souhegan.
RASPBERRIES, RED. Cuthbert, Turner, Shaffer.
STRAWBERRIES. Crescent, Cumberland, Kentucky, Bubach.

## MARSHALL COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Red Astrachan, Early Harvest, Early Strawberry, Summer Queen, Golden Sweet, Sweet Bough.
*Promising.*—Yellow Transparent, Tetofsky, Duchess of Oldenburg.
*Fall.*—Maiden Blush, Rambo, Haas, Fameuse or Snow.
*Promising.*—Wealthy.
*Winter.*—Grimes' Golden, Baldwin, Ben Davis, Tulpehocken, Roman Stem, Northern Spy, Jonathan, Willow Twig, Wagoner, Smith's Cider, King, Belmont, Rhode Island Greening, Tolman Sweet.
*Crabs.*—Transcendent, Whitney No. 20, Soulard, Hyslop, General Grant.
PLUMS. Wild Goose, Bradshaw, Lombard, Green Gage.
PEARS. Bartlett, Flemish Beauty, Clapp's Favorite, Seckel, Beurre d' Anjou, Doyenne d' Ete.
*Promising.*—Kieffer.
CHERRIES. Early Richmond, Olivet, Dye House, May Duke.
*Promising.*—Ostheim, Ida, Louis Phillip.
QUINCES. Orange.
GRAPES. Concord, Worden, Ives' Seedling, Wilder, Pocklington, Brighton, Moore's Early, Martha, Delaware, Niagara.
CURRANTS. Cherry, Versailles, White Grape, Red Dutch.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Downing, Houghton.
*Promising.*—Industry.
BLACKBERRIES. Snyder, Stone's Hardy, Lawton.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Souhegan, Ohio, Mammoth Cluster.
RASPBERRIES, RED. Cuthbert, Shaffer's Colossal, Turner.
STRAWBERRIES. Crescent, Cumberland Triumph, Green's Prolific, Bubach, Jessie, Jewell, Sharpless, Manchester, Bidwell, Miner's Prolific.
*Promising.*—Crawford, Haverland.

## MARION COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Benoni, Red Astrachan, Keswick Codlin, Red Stripe, Golden Sweet, Kirkbridge White, Duchess of Oldenburg, Sweet Bough, Early Joe.
*Promising.*—Yellow Transparent, Chenango.
*Fall.*—Maiden Blush, Rambo, Gravenstein, Fall Wine, Fameuse or Snow, Holland Pippin.
*Promising.*—Wealthy.
*Winter.*—Ben Davis, Romanstem, Grimes' Golden, White Pippin, Rome Beauty, Indiana Favorite, Smith's Cider, Clayton, Stark, Tulpehocken, Red Sweet Pippin, Willow Twig, Tolman Sweet, Lansingburg.
*Promising.*—York Imperial, Pewaukee, Mann.

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*Crabs.*—Whitney No. 20, Transcendent, Hyslop.

PEACHES. Crawford Early, Old Mixon Free, Early Beatrice Alexander, Stump, Heath Cling, Smock, Old Mixon Cling, Kilborn. Not a reliable crop.

PLUMS. Robinson, Lombard Wild Goose, Blue Damson, Miner, Green Gage, Yellow Gage, German Prune.

*Promising*—Wolf, Pottawattomie, Hawkeye, Moore's Arctic.

PEARS. Duchess, Clapp's Favorite, Bartlett, Beurre d' Anjou, Flemish Beauty, Doyenne d' Ete, Lawrence, Sheldon, Beurre d' Waterloo.

*Promising.*—Kieffer Mt. Vernon, Garber.

CHERRIES. Early May, Late Duke, Empress Eugenie.

*Promising.*—Montmorency, Dye House, Ostheim.

QUINCES. Orange, Champion, Missouri Mammoth.

GRAPES. Concord, Worden, Moore's Early, Ives' Seedling, Martha, Salem, Lindley, Hartford, Agawam, Brighton.

*Promising.*—Niagara, Pocklington, Woodruff Red.

CURRANTS. Fay's Prolific, Red Dutch, White Dutch, Knight's Sweet Red, White Grape, Cherry.

GOOSEBERRIES. Downing, Smith's Improved, Houghton, Mountain Seedling.

*Promising.*—Industry, Champion.

BLACKBERRIES. Snyder, Stone's Hardy, Taylor.

*Promising.*—Ancient Briton.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Souhegan, Mammoth Cluster, Hopkins.

RASPBERRIES, RED. Cuthbert, Marlboro, Turner.

STRAWBERRIES. Crescent, Cumberland Triumph, Sharpless, Bubach, Jessie, Jersey Queen Manchester, Wilson's Albany.

*Promising.*—Gandy, Warfield.

## MIAMI COUNTY.

APPLES. *Summer.*—Yellow Transparent, Red Astrachan.

*Fall.*—Duchess of Oldenburg, Haas, Alexander, Wealthy.

*Winter.*—Pewaukee, Walbridge, Mann, McIntosh.

*Promising.*—Salome.

*Crabs.*—Whitney No. 20, Transcendent.

PEACHES. Early Canada, Foster.

PEARS. Flemish Beauty, Kieffer, Clapp's Favorite, Howell.

CHERRIES. Early Richmond, Montmorency.

*Promising.*—Ostheim, Dye House.

QUINCES. Champion.

GRAPES. Moore's Early, Pocklington, Worden, Niagara.

CURRANTS. Fay's Prolific, White Grape, Cherry.

GOOSEBERRIES Downing.

BLACKBERRIES. Taylor, Snyder.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Souhegan, Ohio.

RASPBERRIES, Red. Shaffer's Colossal.

STRAWBERRIES. Sharpless, Manchester, Crescent.

## MONROE COUNTY—THREE REPORTS.

APPLES *Summer.*—Early Harvest, Summer Queen, Red Astrachan, Keswick Codlin, Red June, Duchess of Oldenburg.

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*Fall.*—Maiden Blush, Rambo, Fall Pippin.

*Winter.*—Grimes' Golden, Rome Beauty, Tulpehocken, Ben Davis, Wine Sap, Northern Spy, King, Janet, Roxbury Russet, Willow Twig, American Golden Russet.

*Crabs.*—Transcendent, Kentucky Red, Hyslop, General Grant, Orion.

PEACHES. Schumaker, Heath Cling, Crawford Early, Foster, Old Mixon Free, Old Mixon Cling.

PLUMS. Blue Damson, Lombard, Wild Goose, Weaver.

PEARS. Bartlett, Clapp's Favorite, Seckel.

CHERRIES. Early Richmond, May Duke, Yellow Spanish.

QUINCES. Orange.

GRAPES. Catawba, Concord, Delaware, Martha, Ives' Seedling.

CURRANTS. Red Dutch.

GOOSEBERRIES. Downing, Houghton.

BLACKBERRIES. Snyder.

RASPBERRIES, BLACK. Gregg, Miller's Daily, Mammoth Cluster.

RASPBERRIES, RED. Cuthbert.

STRAWBERRIES. Wilson's Albany, Sharpless.

## MONTGOMERY COUNTY—TWO REPORTS.

APPLES. *Summer.*—Tetofsky, Red Astrachan, Duchess of Oldenburg, Early Harvest, Red Stripe.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Fall Wine, Twenty Ounce, Rambo.

*Promising.*—Wealthy.

*Winter.*—Grimes' Golden, Rome Beauty, Ben Davis, Jonathan, White Pippin, Willow Twig, Jersey Black, Janet.

*Promising.*—Mann, Pewaukee, Walbridge.

*Crabs.*—Transcendent, Whitney No. 20, Hyslop.

PLUMS. Wild Goose, Robinson, Blue Damson.

PEARS. Clapp's Favorite, Flemish Beauty, Sheldon, Beurre d' Anjou.

*Promising.*—Kieffer, Garber.

CHERRIES. Early Richmond, English Morello.

*Promising.*—Olivet, Late Richmond, Dye House.

GRAPES. Concord, Moore's Early, Martha, Ive's seedling, Pocklington, Delaware, Empire State.

*Promising.*—Niagara.

CURRANTS. Fay's Prolific, Red Dutch, White Dutch, Cherry.

GOOSEBERRIES. Crown Bob, Downing.

BLACKBERRIES. Snyder, Wilson's Early, Taylor.

RASPBERRIES, BLACK. Gregg, Mammoth Cluster.

RASPBERRIES, RED. Shaffer's Colossal.

STRAWBERRIES. Crescent, Wilson's Albany, Kentucky.

*Promising.*—Wabash, Jessie.

## MORGAN COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Red June.

*Fall.*—Tulpehocken, Maiden Blush, Rambo, Fall Pippin, Fall Wine.

*Winter.*—Ben Davis, Baldwin, Rome Beauty, Wine Sap, Janet, Yellow Bellflower, Red Sweet Pippin, Stark, Willow, Clayton.

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*Crabs.*—Whitney, Transcendent.

PEACHES. Crawford Early, Crawford Late, Heath Cling, Old Mixon Cling, Stump, Smock, Troth's Early.

PLUMS. Wild Goose, Robinson, Lombard, German Prune.

PEARS. Bartlett, Sheldon, Seckel, Lawrence.

CHERRIES. Early May, Yellow Spanish, Governor Wood.

GRAPES. Concord, Ives' Seedling, Moore's Early, Worden.

GOOSEBERRIES. Downing, Mountain Seedling, Houghton.

RASPBERRIES, BLACK. Gregg, Ohio, Hopkins, Souhegan.

RASPBERRIES, RED. Cuthbert, Turner.

STRAWBERRIES. Sharpless, Crescent, Glendale.

## NEWTON COUNTY—TWO REPORTS

APPLES. *Summer.*—Red Astrachan, Early Harvest, Summer Queen.

*Fall.*—Fameuse or Snow, Rambo, Maiden Blush.

*Winter.*—Yellow Bellflower, White Pippin, Northern Spy, Rhode Island Greening, Roman Stem, Ben Davis, Limber Twig, Baldwin, Janet.

*Crabs.*—All succeed.

PLUMS. Wild Goose, Blue Damson.

PEARS. After two or three crops die with blight.

CHERRIES.—Early Richmond.

GRAPES. Concord, Isabella.

DEWBERRIES. All kinds do well.

RASPBERRIES, RED. Cuthbert.

STRAWBERRIES. Sharpless.

## NOBLE COUNTY—TWO REPORTS

APPLES. *Summer.*—Early Harvest, Red Astrachan, Sweet Bough, Golden Sweet.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Jersey Sweet, Rambo, Fall Pippin, Duchess of Oldenburg, Belmont.

*Winter.*—Baldwin, Ben Davis, Tulpehocken, Jonathan, Rhode Island Greening, Smith's Cider, Tolman Sweet, Northern Spy, Twenty Ounce, Clayton.

*Promising.*—Salome, Mann.

*Crabs.*—Transcendent, Red Siberian.

*Promising.*—Orion.

PLUMS. Wild Goose, Robinson, Weaver, Green Gage, Marianna, Lombard, Quackenboss, Miner.

*Promising.*—Abundance or Botan, Prunus Simoni, Prunus Pissardi.

PEARS. Clapp's Favorite, Beurre d' Anjou, Bartlett, Flemish Beauty, Sheldon, Onondaga.

*Promising.*—Kieffer, Garber.

CHERRIES. Early Richmond.

QUINCES. Orange.

*Promising.*—Champion, Meech's Prolific, Missouri Mammoth, Reas' Mammoth.

GRAPES. Concord, Worden, Delaware.

*Promising.*—Niagara.

CURRANTS. Versailles, Fay's Prolific.

*Promising.*—Lee's Prolific.

GOOSEBERRIES. Houghton, Smith's Improved, Mountain Seedling.

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RASPBERRIES, BLACK. Gregg, Souhegan, Ohio, Mammoth Cluster.
RASPBERRIES, RED. Cuthbert, Philadelphia.
*Promising.*—Hansell, Marlboro.
STRAWBERRIES. Crescent, Sharpless, Wilson's Albany, Captain Jack, Miner Cumberland Triumph or Jumbo.
*Promising.*—Early Michael.

## OHIO COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Strawberry, Red Astrachan, Gravenstein, Fourth of July, Summer Queen, Early Harvest, Red June.
*Fall.*—Maiden Blush, Fall Pippin, Autumn Strawberry.
*Promising.*—Fall Orange.
*Winter.*—Rome Beauty, Broadwell Sweet, Ben Davis, Smith's Cider, Tewksbury Blush, Rhode Island Greening, Baldwin, Lansingburg, Milam, Jonathan, Stark.
*Promising.*—Gano, Moore's Sweet or Red Sweet Pippin.
*Crabs.*—Hughes.
PEACHES. Heath Cling, Stump, Crawford Early, Crawford Late, Troth's Early, Honest John,
PLUMS. Robinson, Green Gage, Wild Goose.
*Promising.*—Clinton or Miner.
PEARS. Bartlett, Seckel, Kieffer, Beurre d'Anjou, Flemish Beauty, Osband's Summer, Lawrence, Duchess.
*Promising.*—Kieffer.
CHERRIES. Early Richmond, Dye House, Black Tartarian, Whi e Tartarian.
QUINCES. Orange.
GRAPES. Concord, Moore's Early, Brighton, Vergennes, Delaware, Cottage, Ives' Seedling, Agawam.
*Promising.*—Early Victor, Riggs.
CURRANTS. Red Dutch, Fay's Prolific.
GOOSEBERRIES. Downing, Houghton.
*Promising.* Smith's Improved.
BLACKBERRIES. Snyder, Taylor, Kittatinny (rusts some), Lawton.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Souhegan, Gregg, Mammoth Cluster.
*Promising.*—Ohio.
RASPBERRIES, RED. Shaffer's Colossal, Cuthbert, Hansell, Turner.
STRAWBERRIES. Crescent, Sharpless, Green's Prolific, Charles Downing, Kentucky.

## ORANGE COUNTY—SIX REPORTS.

APPLES. *Summer.*—Benoni, Red Astrachan, Early Harvest, Golden Sweet, Red Stripe, Yellow Transparent.
*Fall.*—Maiden's Blush, Pennsylvania Red Streak, Rambo, Tulpehocken, Fall Wine, Jersey Sweet, Wealthy.
*Promising.*—Duchess of Oldenburg, Alexander, Flora Bellflower.
*Winter.*—Ben Davis, Jonathan, Rome Beauty, Grimes' Golden, Wine Sap, Indian, Clayton, Lawver, Jersey Black, Alma Sweet, Janet, Smith's Cider, Stark, Milam, Willow Twig, Dominie.
*Promising.*—York Imperial.
*Crabs.*—Kentucky Red, Hughes.



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PEACHES. Crawford Early, Crawford Late, Heath Cling, Fleenor, Honest John, Hale's Early, Old Mixon Free, Wager, Amsden.
PLUMS. Wild Goose, Blue Damson, Robinson, Newman, Weaver.
PEARS. Bartlett, Flemish Beauty, Clapp's Favorite, Kieffer, Duchess, Beurre d' Anjou, Seckel, President.
CHERRIES. Early Richmond, English Morello, May Duke, Olivet, Bell de Choicey.
QUINCES. Orange.
*Promising.*—Champion.
GRAPES. Concord, Niagara, Empire State, Martha.
CURRANTS. Fay's Prolific, Red Dutch, Cherry, White Grape.
GOOSEBERRIES. Downing, Houghton, Mountain Seedling.
BLACKBERRIES. Lawton.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Mammoth Cluster, Tyler or Souhegan.
RASPBERRIES, RED. Turner, Shaffer's Colossal.
STRAWBERRIES. Crescent, Charles Downing, Sharpless, May King, Jessie, Logan, Wilson's Albany.

## OWEN COUNTY.

APPLES. *Summer.*—Red June, Early Harvest.
*Fall.*—Maiden Blush, Rambo, Fall Pippin.
*Winter.*—Rome Beauty, Ben Davis, White Pippin, Red Sweet Pippin, Yellow Bellflower.
PLUMS. Blue Damson, Wild Goose.
*Promising.*—Robinson.
PEARS. Bartlett.
*Promising.*—Kieffer.
CHERRIES. Early May.
GRAPES. Concord, Ives' Seedling.
*Promising.*—Martha.
CURRANTS. Red Dutch.
GOOSEBERRIES. Downing, Houghton.
RASPBERRIES, BLACK. Gregg, Souhegan.
STRAWBERRIES. Sharpless, Crescent, Wilson's Albany.

## PARKE COUNTY—THREE REPORTS.

APPLES. *Summer.*—Benoni, Red Astrachan, Early Harvest, Golden Sweet, Yellow June, Summer Rose, Duchess of Oldenburg.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden Blush, Rambo, Fall Wine, Fall Pippin, Porter, Ross Nonpareil.
*Promising.*—Wolf River, Alexander, Wealthy.
*Winter.*—Grimes' Golden, Rome Beauty, Roman Stem, Jonathan, Limber Twig, Ben Davis, Clayton, Stark, Pewaukee, Indiana Favorite, Red Sweet Pippin, Michael Henry Pippin, Jersey Black, Wine Sap.
*Crabs.*—Hyslop, Transcendent, Hughes, Quaker Beauty, Whitney No. 20.
PEACHES. Alexander, Heath Cling, George IV, Old Mixon Free, Stump, Crawford Early, Smock. (Crop uncertain).
PLUMS. Wild Goose, Miner, Blue Damson, Robinson.
*Promising.*—DeSoto, Wolf, Marianna.

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PEARS. Duchess, Kieffer, Bartlett, Flemish Beauty, Clapp's Favorite, Bloodgood, Tyson, Beurre d' Anjou.

*Promising.*—Garber.

CHERRIES. Early May, English Morello, May Duke.

QUINCES. Orange.

GRAPES. Concord, Ives' Seedling, Moore's Early, Niagara, Clinton, Agawam, Pocklington, Clinton.

CURRANTS. Fay's Prolific, Red Dutch, Cherry, White Grape, Versailles.

GOOSEBERRIES. Downing, Houghton, Smith's Improved, Mountain Seedling.

*Promising.*—Industry.

BLACKBERRIES. Snyder, Stone's Hardy, Taylor, Ancient Briton.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Mammoth Cluster, Ohio, Souhegan.

RASPBERRIES, RED. Cuthbert, Turner, Brandywine, Shaffer's Colossal.

STRAWBERRIES. Crescent, Windsor Chief, Green's Prolific, Jessie, Cumberland Triumph, Sharpless, Kentucky, Captain Jack, Jersey Queen.

## PERRY COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Red June, Red Astrachan, Summer Queen, Duchess of Oldenburg, Horse.

*Fall.*—Maiden Blush, Fall Queen.

*Winter.*—Grimes' Golden, Ben Davis, Rome Beauty, Wine Sap, Janet, Pottinger, or Big Rea, Roxbury Russett, Shockley.

*Crabs.*—Hughes, Kentucky Red, Transcendent.

PEACHES. Amsden, Smock, Crawford's Early, Ashby, Heath Cling, Old Mixon Free.

PLUMS. Wild Goose, Blue Damson.

PEARS. Early Harvest, Seckel, Bartlett.

*Promising.*—Kieffer.

CHERRIES. Early Richmond, Yellow Spanish, May Duke.

QUINCES. Orange.

GRAPES. Concord, Ives' Seedling, Perkins.

*Promising.*—Worden.

CURRANTS. Fay's Prolific, Red Dutch, Cherry.

GOOSEBERRIES. Houghton.

BLACKBERRIES. Snyder.

RASPBERRIES, BLACK. Gregg.

RASPBERRIES, RED. Crimson Beauty, Cuthbert.

STRAWBERRIES. Crescent, Kentucky.

*Promising.*—Jessie.

## PORTER COUNTY—TWO REPORTS.

APPLES. *Summer.*—Yellow Transparent, Red Astrachan, Sops of Wine.

*Fall.*—Maiden Blush, Alexander, Fameuse or Snow, Gravenstein, Porter, Sweet Russett.

*Winter.*—Northern Spy, Ben Davis, Willow Twig, Baldwin, Yellow Bellflower, English Russett.

*Crabs.*—Transcendent.

PLUMS. Blue Damson, Wild Goose.

*Promising.*—Robinson.

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PEARS. Flemish Beauty, Bartlett, Clapp's Favorite, L. B. Jersey, Beurre d'Anjou, Kieffer.
CHERRIES. Early Richmond.
GRAPES. Concord, Brighton, Worden.
CURRANTS. Fay's Prolific, Cherry.
BLACKBERRIES. Snyder, Taylor, Agawam.
RASPBERRIES, BLACK. Gregg, Ohio, Souhegan.
RASPBERRIES, RED. Cuthbert, Shaffer's Colossal.
STRAWBERRIES. Crescent, Sharpless, Wilson's Albany, Phelps' Seedling.
*Promising.* Jessie, Gandy, Monmouth.

## POSEY COUNTY.

APPLES. *Summer.*—Horse, Red Stripe.
*Fall.*—Rambo.
*Winter.*—Wine Sap, Rome Beauty, Ben Davis, Limber Twig, White Pippin, Prior Red.
PEACHES. Heath Cling.
PLUMS. Wild Goose, Blue Damson.
PEARS. Seckel.
CHERRIES. Early Richmond, May Duke, Governor Wood.

## PULASKI COUNTY.

APPLES. *Summer.*—Duchess of Oldenburg, Red Astrachan, Sops of Wine, Tetofsky.
*Fall.*—Fameuse, Lowell, St. Lawrence, Alexander.
*Winter.*—Winter Wine or Pennsylvania. Red Streak, Roman Stem, Tolman's Sweet, English Russett, Perry Russett, Rawles' Janet.
*Crabs.*—Transcendent, Whitney, Hyslop.
PEACHES. Not reliable.
PLUMS. Wild Goose, Robinson, De Soto, Marianna.
PEARS. Flemish Beauty, Sheldon.
CHERRIES. Early Richmond or Early May, English Morello.
*Promising.*—Montmorency, Olivet.
GRAPES. Worden, Concord, Pocklington, Martha.
CURRANTS. Red Dutch, White Dutch, Cherry, Versailles.
*Promising.*—Fay's.
GOOSEBERRIES. Downing, Houghton, Mountain Seedling, Smith's Improved.
BLACKBERRIES. Snyder, Taylor.
RASPBERRIES, BLACK. Gregg, Ohio, Souhegan.
RASPBERRIES, RED. Shaffer, Turner, Cuthbert.
STRAWBERRIES. Daniel Boone, Parry, Sharpless, Itaska, Duchess.
*Promising.*—Jessie, Logan.

## PUTNAM COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Benoni, Golden Sweet, Red June.
*Fall.*—Maiden Blush, Rambo, Fall Pippin.
*Winter.*—Ben Davis, Grimes' Golden, Jersey Black, Roman Stem, Wine Sap, Tulpehocken, Mosier Sweet, Tolman Sweet, Clayton, Janet, Rome Beauty, Pewaukee, Stark, Lansingburg.

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*Crabs.*—Transcendent, Hyslop.

PEACHES. Amsden, Smock, Morris White, Early Crawford, Troth's Early, Heath Cling, Hale's Early, Old Mixon Cling. (Crop uncertain).

PLUMS. Robinson, Wild Goose, Blue Damson, Lombard, Weaver, Miner.
*Promising.*—Shippers' Pride, Kelsey's Japan.

PEARS. Duchess, Kieffer, Bartlett, Clapp's Favorite, Flemish Beauty, Seckel, Sheldon, Bloodgood.

CHERRIES. Early Richmond, English Morello.

QUINCES. Orange.

GRAPES. Concord, Ives' Seedling, Moore's Early, Niagara, Worden, Delaware, Isabella.

CURRANTS. Fay's Prolific, Red Dutch, White Grape.

GOOSEBERRIES. Houghton, Downing.

BLACKBERRIES. Snyder, Agawam, Stone's Hardy, Lawton.
*Promising.*—Erie.

DEWBERRIES.—Lucretia.

RASPBERRIES, BLACK. Gregg, Tyler.
*Promising.*—Ohio.

RASPBERRIES, RED. Turner, Shaffer's Colossal, Cuthbert, Brandywine.
*Promising.*—Marlboro.

STRAWBERRIES. Crescent, Cumberland Triumph, Sharpless, Wilson's Albany, Captain Jack.
*Promising.*—Logan.

## RIPLEY COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Early Strawberry, Summer Queen, Red Astrachan, Sweet Bough.
*Full.*—Maiden Blush, Rambo, Tulpehocken.
*Winter.*—Ben Davis, Rome Beauty, Grimes' Golden, Wine Sap, Baldwin, Stark, Smith's Cider, Gilpin.

PLUMS. Imperial Gage, Blue Damson, Wild Goose.

CHERRIES. Early May, English Morello, May Duke, Governor Wood.

QUINCES. Orange.

GRAPES. Concord, Delaware, Niagara, Ives' Seedling, Brighton, Catawba.

RASPBERRIES. Gregg.

STRAWBERRIES. Kentucky.

## RUSH COUNTY--FOUR REPORTS.

APPLES. *Summer.*—Red Astrachan, Duchess of Oldenburg, Early Harvest, Benoni, Summer Queen, Tetofsky, Golden Sweet, Yellow June.
*Fall.*—Maiden Blush, Rambo, Fall Pippin, Porter, Haas, Fall Wine.
*Winter.*—Ben Davis, Rome Beauty, Roman Stem, Smith's Cider, Peck's Pleasant, Grimes' Golden, Pewaukee, Baldwin, Esopus Spitzenburg, Wine Sap, Roxbury Russet, Tolman Sweet, Dominie.
*Promising*—Clayton, Mann.
*Crabs.*—Transcendent, Whitney No. 20, Hyslop, Quaker Beauty.

PEACHES. Crawford Early, Old Mixon Free, Heath Cling, Heath Free, Hale's Early, Honest John, Lord Palmerston.
*Promising.*—Schumaker, Mrs. Brett.

PLUMS. Lombard, Blue Damson, Shippers' Pride, Wolf, Weaver, Wild Goose, Moore's Arctic.

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*Promising.*—Coe's Golden Drop, Abundance.

PEARS. Bartlett, Clapp's Favorite, Duchess, Flemish Beauty, Kieffer, Sheldon, Beurre d'Anjou, Lawrence.

CHERRIES. Early Richmond, Montmorency, Dye House, Governor Wood, Black Tartarian, English Morêllo.

QUINCES. Orange, Champion.

GRAPES. Concord, Niagara, Worden, Moore's Early, Ives' Seedling, Delaware, Clinton, Catawba, Martha.

*Promising.*—Empire State, Pocklington.

CURRANTS. Fay's Prolific, Red Dutch, Cherry, White Grape.

GOOSEBERRIES. Downing, Houghton, Smith's Improved.

BLACKBERRIES. Snyder, Taylor, Stone's Hardy, Kittatinny.

DEWBERRIES. Lucretia.

RASBPERRIES, BLACK. Gregg, Tyler, Ohio, Mammoth Cluster.

RASPBERRIES, RED. Cuthbert, Turner, Brandywine.

STRAWBERRIES. Crescent, Cumberland Triumph, Sharpless, Kentucky, Warfield.

## SCOTT COUNTY—TWO REPORTS.

APPLES. *Summer.*—Benoni, Red Astrachan, Early Harvest, Golden Sweet, Red June, Sweet Bough.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Rambo, Fall Wine.

*Winter.*—Ben Davis, Grimes' Golden, Rome Beauty, Baldwin, Jersey Black, Janet, Yellow Bellflower.

*Promising.*—Stark, Mann.

*Crabs.*—Transcendent, Hyslop, Hughes.

PEACHES. Amsden, Crawford Early, Crawford Late, Heath Cling, Old Mixon Cling, Heath Free, Fleenor, Honest John, Early York.

PLUMS. Wild Goose, Blue Damson, Green Gage, Yellow Gage, Robinson, Weaver.

PEARS. Bartlett, Flemish Beauty, Seckel, Clapp's Favorite.

CHERRIES. Early May, Yellow Spanish.

QUINCES. Orange.

*Promising.*—Champion.

GRAPES. Concord, Ives' Seedling, Catawba, Perkins, Delaware.

*Promising.*—Worden, Niagara.

CURRANTS. Cherry, Versailles, White Grape, Red Dutch.

*Promising.*—Fay's Prolific.

GOOSEBERRIES. Houghton, Downing, Smith's Improved.

BLACKBERRIES. Snyder, Taylor, Lawton.

RASPBERRIES, BLACK. Gregg.

RASPBERRIES, RED. Cuthbert, Turner.

STRAWBERRIES. Crescent, Sharpless, Charles Downing, Wilson's Albany.

## SHELBY COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Yellow Transparent, Red June.

*Fall.*—Duchess of Oldenburg, Sops of Wine, Rambo.

*Winter.*—Rome Beauty, Ben Davis, Smith's Cider, Flora Bellflower, Walker's Beauty, Janet, Milam, Prior's Red.

*Crabs.*—Whitney No. 20, General Grant.

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PEACHES. Early Canada, Amsden, Old Mixon Free, Heath Cling.
PLUMS. Shippers' Pride, Marianna, Forest Rose, German Prune, Blue Damson, Lombard, Coe's Golden Drop.
PEARS. Bartlett, Clapp's Favorite, L. B. Jersey, Vicar, Kieffer, Sheldon.
CHERRIES. Montmorency, Early Richmond, Dye House.
QUINCES. Champion, Rea's Mammoth.
APRICOTS. J. L. Budd, Golden Drop.
GRAPES. Concord, Moore's Early, Niagara, Pocklington, Vergennes.
CURRANTS. Fay's Prolific, Versailles, Red Dutch, White Grape.
GOOSEBERRIES. Downing, Smith's Improved, Industry.
BLACKBERRIES. Snyder, Kittatinny.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Mammoth Cluster, Johnston's Sweet, Ohio, Souhegan.
RASPBERRIES, RED. Cuthbert, Shaffer's Colossal.
STRAWBERRIES. Bubach, Crescent, Jersey Queen.

## SPENCER COUNTY—TWO REPORTS.

APPLES. *Summer.*—Red June, Benoni, Yellow June, Early Harvest, Summer Queen, Summer Rose, Red Astrachan.
*Promising.*—Yellow Transparent.
*Fall.*—Maiden Blush, Rambo, Bailey Sweet, Fall Queen, Haas.
*Winter.*—Rome Beauty, Wine Sap, Ben Davis, Grimes' Golden, Smith's Cider, Limber Twig, Fink (small, long keeper), Janet.
*Promising.*—Indian, Lawver, Missouri Pippin.
*Crabs.*—Hughes, Transcendent.
PEACHES. Heath Cling, Amsden, Alexander, Crawford Early, Chinese Cling, Stump Cling, Blood Cling, Old Mixon Cling, Old Mixon Free.
PLUMS. Wild Goose, Blue Damson.
*Promising.*—Lombard.
PEARS. Bartlett, L. B. Jersey, Duchess, Flemish Beauty, Lawrence.
*Promising.*—Kieffer.
CHERRIES. Early Richmond, English Morello, Governor Wood, May Duke.
QUINCES. Orange, Champion, Meech's Prolific.
APRICOTS. Moorpark, Peach.
GRAPES. Concord, Ives' Seedling, Lady Washington, Martha, Jefferson, Pocklington.
*Promising.*—Moore's Early, Niagara, Empire State.
CURRANTS. Cherry, Versailles, White Grape.
*Promising.*—Fay's Prolific.
GOOSEBERRIES. Houghton, Downing.
*Promising.*—Smith's Improved, Industry.
BLACKBERRIES. Snyder, Kittatinny, Erie.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Mammoth Cluster.
RASPBERRIES, RED. Cuthbert, Turner, Hansell.
STRAWBERRIES. Crescent, Wilson's Albany, Kentucky, Jessie, Itasca.

## STEUBEN COUNTY.

APPLES. *Summer.*—Red Astrachan, Summer Queen, Early Harvest, Sweet Bough, Keswick Codlin.

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*Promising.*—Yellow Transparent.

*Fall.*—Maiden's Blush, Gravenstein, Fall Pippin, Alexander.

*Promising.*—Duchess of Oldenburg, Wealthy.

*Winter.*—Baldwin, Rhode Island Greening, Wagoner, Grimes' Golden, Dominie, Jonathan, King, Tolman Sweet.

*Promising.*—Lawver, Stark.

*Crabs.*—Transcendent, Hyslop.

*Promising.*—Whitney No. 20, Martha.

PEACHES. Alexander, Crawford Early, Crawford Late, Old Mixon Cling, Wagner, Foster.

PLUMS. Green Gage, Miner, Lombard, Blue Damson.

PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Seckel, Lawrence, Beurre d' Anjou, Duchess.

*Promising.*—Lawson.

CHERRIES. Early Richmond, Empress Eugenie.

QUINCES. Orange, Champion.

*Promising.*—Meech's Prolific.

GRAPES. Worden, Niagara, Concord, Delaware, Salem, Pocklington.

*Promising.*—Eaton, Moyer, Woodruff Red, Empire State.

CURRANTS. Fay's Prolific, White Grape, Victoria.

GOOSEBERRIES. Downing, Smith's Improved.

*Promising.*—Industry.

BLACKBERRIES. Taylor, Erie, Agawam.

*Promising.*—Ancient Briton.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Souhegan, Gregg.

*Promising.*—Hilborn, Johnston's Sweet.

RASPBERRIES, RED. Shaffer's Colossal, Cuthbert.

STRAWBERRIES. Jessie, Bubach, Haverland, Sharpless.

*Promising.*—Crawford, Gandy.

## SULLIVAN COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Benoni, Red Astrachan, Early Harvest, Red Stripe, Duchess of Oldenburg, Golden Sweet, Tetofsky, Horse.

*Fall.*—Maiden Blush, Rambo, Autumn Strawberry, Fall Pippin.

*Winter.*—Ben Davis, Wine Sap, Rome Beauty, Janet, Clayton, Willow Twig, Yellow Bellflower, Smith's Cider, Michael Henry Pippin.

*Crabs.*—Transcendent, Hyslop, Hughes, Quaker Beauty.

PEARS. Duchess, Bartlett, Clapp's Favorite, Kieffer, Seckel, L. B. Jersey. All die easily except Kieffer.

CHERRIES. Early May, English Morello, Black Heart.

QUINCES. Orange.

GRAPES. Concord, Ives' Seedling, Martha.

CURRANTS. Versailles, White Grape, Red Dutch, Lee's Prolific.

GOOSEBERRIES. Downing, Houghton, Mountain Seedling.

BLACKBERRIES. Snyder, Lawton.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Mammoth Cluster, Doolittle.

RASPBERRIES, RED. Cuthbert, Turner.

STRAWBERRIES. Captain Jack, Cumberland Triumph, Crescent, Wilson's Albany.

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## SWITZERLAND COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Early Harvest, Benoni, Red Astrachan, Trenton Early, American Summer Pearmain.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Rambo, Tulpehocken, Porter.

*Winter.*—Ben Davis, York Imperial, Rome Beauty, Wine Sap, Smith's Cider, Moore's Sweet or Red Sweet Pippin, Janet, Lansingburg, Gilpin, Grimes' Golden, Jersey Black, Northern Spy.

*Crabs.*—Quaker Beauty, Hughes.

PEACHES. Crawford Early, Troth's Early, Old Mixon Cling, Smock, Heath Cling, Honest John, Salway, Waterloo.

PLUMS. Blue Damson, Green Gage, Jefferson, Wild Goose, Robinson.

PEARS. Bartlett, Flemish Beauty, Seckel, Kieffer, Vicar, Beurre d' Anjou.

CHERRIES. Early May, Black Tartarian, May Duke, Montmorency, Governor Wood.

QUINCES. Orange.

GRAPES. Concord, Ives' Seedling, Moore's Early, Worden, Brighton, Martha, Delaware, Hartford.

*Promising.*—Niagara, Empire State.

CURRANTS. Fay's Prolific, Red Dutch.

BLACKBERRIES. Snyder, Taylor, Lawton.

RASPBERRIES, BLACK Gregg, Souhegan.

RASPBERRIES, RED. Reliance, Philadelphia.

STRAWBERRIES. Sharpless, Charles Downing, Bidwell, Crescent, Windsor Chief, Captain Jack, Glendale.

*Promising.*—Jessie.

## TIPPECANOE COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Benoni, Red Astrachan, Duchess of Oldenburg.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Bailey Sweet, Rambo, Fall Pippin, Fameuse or Snow.

*Promising.*—Wealthy.

*Winter.*—Wine Sap, Rome Beauty, Vandevere, Ben Davis, Willow Twig, Stark, Northern Spy, Baldwin.

*Promising.*—Missouri Pippin.

*Crabs.*—Transcendent.

*Promising.*—Whitney No. 20, Martha.

PLUMS. Blue Damson, Robinson, Wild Goose.

PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Duchess, Seckel, Kieffer.

CHERRIES. Early Richmond.

GRAPES. Concord, Worden, Moore's Early, Brighton, Agawam, Niagara, Delaware, Martha.

CURRANTS. Fay's Prolific, Red Dutch, White Dutch, White Grape.

*Promising.*—Lee's Prolific, Crandall.

GOOSEBERRIES. Early Orange, Downing, Houghton, Mountain Seedling.

BLACKBERRIES. Snyder, Taylor, Wallace, Erie.

*Promising.*—Minnewaski.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Nemaha, Hilborn, Hopkins, Tyler.

*Promising.*—Ada.

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RASPBERRIES, RED. Cuthbert, Turner, Brandywine, Reliance.
STRAWBERRIES. Warfield, Bubach, Logan, Cumberland Triumph, Crescent, Green's Prolific, Mt. Vernon.
*Promising.*—Haverland, Crawford, Monmouth.

## UNION COUNTY.

APPLES. *Summer.*—Early Harvest.
*Fall.*—Maiden Blush, Fall Pippin, Rambo.
*Winter.*—Indiana Favorite, Northern Spy, Wine Sap, Rhode Island Greening, Ben Davis.
PEARS. Flemish Beauty, Bartlett.
QUINCES. Orange.
GRAPES. Concord.
BLACKBERRIES. Snyder.
RASPBERRIES, BLACK. Mammoth Cluster, Gregg.
STRAWBERRIES. Captain Jack, Kentucky, Wilson's Albany.

## VANDERBURGH COUNTY.

APPLES. *Summer.*—Summer Queen, Red Astrachan, Early Harvest, Horse.
*Fall.*—Maiden Blush, Rambo, Fall Queen.
*Winter.*—Wine Sap, Rome Beauty, Ben Davis.
*Promising.*—Lawver, Huntsman's Favorite.
*Crabs.*—Transcendent, Hyslop, Hughes.
PEACHES. Amsden, Early York, Heath Cling, Old Mixon Free, Old Mixon Cling, Stump, Crawford Late, Smock, Foster.
PLUMS. Wild Goose, Blue Damson.
PEARS. Bartlett, Clapp's Favorite, Flemish Beauty, Osband's Summer.
*Promising.*—Kieffer.
CHERRIES. Early Richmond, English Morello, May Duke, Reine Hortense.
QUINCES. Orange, Champion.
GRAPES. Concord, Ives' Seedling, Agawam.
*Promising.*—Niagara, Eaton.
CURRANTS. Versailles, Fay's Prolific.
GOOSEBERRIES. Houghton.
BLACKBERRIES. Snyder, Lawton.
RASPBERRIES, BLACK. Mammoth Cluster, Gregg.
RASPBERRIES, RED. Turner.
STRAWBERRIES. Kentucky, Sharpless, Crescent, Cumberland Triumph or Jumbo.

## VERMILLION COUNTY—THREE REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Duchess of Oldenburg, Trenton Early.
*Promising.*—Yellow Transparent.
*Fall.*—Wealthy, Rambo, Twenty Ounce, Fall Pippin.
*Winter.*—Rome Beauty, Wine Sap, Grimes' Golden, White Pippin, Smith's Cider, Ben Davis, Northern Spy, Yellow Bellflower.
*Crabs.*—Transcendent, Martha.
PLUMS. Wild Goose, Weaver, Robinson, Moore's Artic, Blue Damson.

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PEARS. Early Richmond, May Duke, Olivet.

GRAPES. Concord, Worden, Moore's Early, Ives Seedling, Brighton, Martha, Delaware, Pocklington.

CURRANTS. Red Dutch, Cherry, White Grape, Victoria.

*Promising.*—Fay's Prolific.

GOOSEBERRIES. Houghton, Downing, Mountain Seedling.

*Promising.*—Industry.

BLACKBERRIES. Snyder, Taylor.

*Promising.*—Erie.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Doolittle, Ohio, Souhegan.

RASPBERRIES, RED. Cuthbert, Turner, Hansell.

*Promising.*—Golden Queen.

STRAWBERRIES. Crescent, Warfield, Wilson's Albany, Sharpless, Manchester, Jersey Queen.

*Promising.*—Jessie, Bubach, Logan.

## VIGO COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Benoni, Red Stripe, Summer Queen, Red June, Duchess of Oldenburg.

*Promising.*—Yellow Transparent.

*Fall.*—Rambo, Fall Wine, Fall Pippin, Maiden Blush.

*Winter.*—Ben Davis, Rome Beauty, Grimes' Golden, Wine Sap, Clayton, White Winter Pearmain, Lawver, Janet, Indiana Favorite.

*Crabs.*—Transcendent, Hyslop.

*Promising.*—Whitney No. 20.

PLUMS. Wild Goose, Robinson, Miner.

PEARS. Beurre d' Anjou, Buffum, Sheldon, Garber, Duchess, Bartlett, Howell, Kieffer, Seckel.

CHERRIES. Early May, English Morello.

QUINCES. Orange.

GRAPES. Worden, Concord, Hartford, Elvira, Lady, Martha, Delaware, Brighton.

*Promising.*—Empire State.

CURRANTS. Fay's Prolific, Red Dutch, Versailles, White Grape.

GOOSEBERRIES. Downing, Houghton.

BLACKBERRIES. Snyder, Taylor, Stone's Hardy, Lawton, Agawam.

*Promising.*—Erie, Early Harvest.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Souhegan, Ohio, Gregg.

RASPBERRIES, RED. Turner, Cuthbert, Brandywine, Shaffer's Colossal.

STRAWBERRIES. Crescent, Sharpless, Windsor Chief, Jersey Queen, Kentucky, May King, Cumberland Triumph.

*Promising.* Bubach, Jessie, Warfield, Haverland, Phillip's Seedling.

## WABASH COUNTY—THREE REPORTS.

APPLES. *Summer.*—Red Astrachan, Summer Rambo, Early Harvest, Golden Sweet.

*Promising.*—Yellow Transparent.

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*Fall.*—Maiden Blush, Duchess of Oldenburg, Fall Orange, Fall Pippin, Fameuse or Snow.

*Winter.*—Grimes' Golden, Ben Davis, Northern Spy, Yellow Bellflower, Rome Beauty, Wine Sap, York Imperial, Smith's Cider, White Pippin.

*Promising.*—Pewaukee, Wealthy, Stark, Mann.

*Crabs.*—Transcendent, Hyslop.

*Promising.*—Whitney No. 20.

PEACHES.—Crawford Early, Foster, Amsden, Alexander, Stump, Heath Cling, Waterloo.

PLUMS. Wild Goose, Lombard, Blue Damson, Shropshire Damson.

*Promising.*—Marianna, Forest Garden.

PEARS. Clapp's Favorite, Flemish Beauty, L. B. Jersey, Bartlett, Beurre d'Anjou, Seckel.

*Promising.*—Warner.

CHERRIES. Wabash, Early Richmond, Montmorency.

*Promising.*—Dye House.

QUINCES. Orange, Champion.

APRICOTS. Peach.

GRAPES. Concord, Delaware, Clinton, Brighton, Hartford, Ives' Seedling, Lady, Niagara.

*Promising.*—Pocklington, Empire State, Moore's Diamond.

CURRANTS. Fay's Prolific, Cherry, Red Dutch, White Grape.

GOOSEBERRIES. Houghton, Downing, Mountain Seedling.

BLACKBERRIES. Snyder, Taylor, Kittatinny, Agawam.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Tyler, Mammoth Cluster.

RASPBERRIES, RED. Cuthbert, Turner, Shaffer's Colossal.

*Promising.*—Thompson's Early.

STRAWBERRIES. Jersey Queen, Wilson's Albany, Crescent, Captain Jack, Sharpless, James Vick, Glendale.

*Promising.*—Jessie, Bubach, Haverland, Gandy.

## WARREN COUNTY—TWO REPORTS.

APPLES. *Summer.*—Red Astrachan, Red June, Summer Queen.

*Fall.*—Maiden's Blush.

*Winter.*—Romanstem, Winter Sweet Paradise, Rome Beauty, Jannet, Northern Spy, Ben Davis, Vandevere, Yellow Bellflower.

*Crabs.*—Whitney No. 20, Transcendent.

PEARS. Bartlett, L. B. Jersey.

CHERRIES. Early Richmond.

GRAPES. Concord.

CURRANTS. Red Dutch.

GOOSEBERRIFS. Downing, Houghton.

BLACKBERRIES. Snyder.

RASPBERRIES, BLACK. Gregg.

RASPBERRIES, RED. Turner.

STRAWBERRIES. Wilson's Albany, Green's Prolific, Crescent.

## WASHINGTON COUNTY—FOUR REPORTS.

APPLES. *Summer.*—Benoni, Golden Sweet, Early Harvest, Yellow June, Red Astrachan, Keswick Codlin, Sweet Bough, Summer Queen, Early Strawberry.

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*Fall.*—Maiden Blush, Rambo, Porter, Belmont, Gravenstein, Fall Pippin, Fall Wine, Haas.

*Winter.*—Grimes' Golden, Rome Beauty, Ben Davis, Stark, Wine Sap, Clayton, Peck's Pleasant, Baldwin, Janet, Gilpin, White Pippin, Roman Stem, Jersey Black, Willow Twig, Westfield Seek-no-further, Milam, Grindstone or American Pippin.

*Promising.*—Salome, Wolf River, Wealthy, Mann.

*Crabs.*—Transcendent, Hughes, Whitney No. 20.

PEACHES. Alexander, Amsden, Hale's Early, Early York, Crawford Early, Crawford Late, Heath Free, Fleenor, Troth's Early, Stump, Smock, Old Mixon Free, Ward's Late.

PLUMS. Blue Damson, Robinson, Wild Goose, German Prune.

*Promising.*—Marianna.

PEARS. Bartlett, Flemish Beauty, Seckel, L. B. Jersey, Duchess, Lawrence, Sheldon, Buffum.

*Promising.*—Kieffer, Winter Nellis.

CHERRIES. Early May, May Duke, Governor Wood.

*Promising.*—Lieb, Yellow Spanish, Late Duke.

QUINCES. Orange, Reas' Mammoth.

*Promising.*—Champion.

GRAPES. Concord, Catawba, Isabella, Delaware, Clinton, Niagara, Hartford, Jefferson.

*Promising.*—Pocklington, Empire State, Vergennes.

CURRANTS. Cherry, White Grape, Red Dutch.

*Promising.*—Fay's Prolific.

GOOSEBERRIES. Downing, Mountain Seedling, Houghton, Industry.

BLACKBERRIES. Snyder, Lawton.

*Promising.*—Early Harvest.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Mammoth Cluster.

*Promising.*—Ohio, Souhegan.

RASPBERRIES, RED. Shaffer's Colossal, Cuthbert, Turner, Philadelphia, Marlboro.

STRAWBERRIES. Crescent, Wilson's Albany, Sharpless, Charles Downing, Manchester, Gandy, Jessie.

## WAYNE COUNTY—FIVE REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, American Summer Pearmain, Benoni, Kirkbridge White, Sweet Bough, Trenton Early.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden Blush, Rambo, Hagloe, Fall Pippin, Duchess of Oldenburg, Twenty Ounce, Autumn Strawberry, Gabriel, Wealthy.

*Winter.*—Indiana Favorite, Roman Stem, Baldwin, Ben Davis, White Pippin, Wine Sap, King, Rome Beauty, Grimes' Golden, Northern Spy, Smith's Cider, Tulpehocken, Vandevere.

*Promising.*—York Imperial.

*Crabs.*—Whitney No. 20, Transcendent, Hyslop.

*Promising.*—Orion, Lady Elgin.

PEACHES. Crawford Early, Crawford Late, Old Mixon Free, Old Mixon Cling, Early York, Smock, Stump, Honest John, Ward's Late, Morris' White, Lemon Cling.

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PLUMS. Blue Damson, Green Gage, Wild Goose, Robinson, Lombard, German Prune, Marianna.

PEARS. Flemish Beauty, Clapp's Favorite, Bartlett, Kieffer, Seckel, Vicar, Lawrence, Buffum, Beurre d' Anjou, Duchess, L. B. Jersey.

*Promising.*—Garber.

CHERRIES. Early Richmond, Montmorency, May Duke, English Morello, Governor Wood, Olivet.

QUINCES. Orange, Champion.

GRAPES. Concord, Worden, Moore's Early, Brighton, Niagara, Delaware, Pocklington, Lady, Martha, Ives' Seedling, Agawam.

*Promising.*—Early Victor, Woodruff Red, Empire State, Elvira.

CURRANTS. Fay's Prolific, Red Dutch, White Grape, Versailles.

*Promising.*—Wilder.

GOOSEBERRIES. Downing, Houghton, Smith's Improved, Early Golden.

*Promising.*—Hixon's Favorite, Champion, Industry.

BLACKBERRIES. Snyder, Ancient Briton, Taylor, Wallace, Kittatinny.

*Promising.*—Erie, Early Harvest (tender), Stone's Hardy, Wilson's Early (tender.)

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Gregg, Ohio, Souhegan, Mammoth Cluster, Doolittle.

RASPBERRIES, RED. Cuthbert, Hansell, Turner, Marlboro.

STRAWBERRIES. Crescent, Cumberland Triumph, Sharpless, Green's Prolific, Charles Downing, Jersey Queen, Bubach, Jessie.

*Promising.* Logan.

## WARRICK COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Yellow June, Summer Queen, Red June.

*Promising.*—Yellow Transparent.

*Fall.*—Maiden's Blush, Rambo.

*Winter.*—Rome Beauty, Wine Sap, Ben Davis, Vandevere.

*Promising.*—Salome.

*Crabs.*—Transcendent, Hyslop.

PEACHES. Crawford Early, Crawford Late, Stump, Heath Cling, Old Mixon Cling, Smock, Mountain Rose.

PLUMS. Wild Goose, Robinson, Blue Damson.

*Promising.*—Prunus Simoni.

PEARS. Bartlett, Kieffer.

*Promising.*—Leconte.

CHERRIES. Early May, Governor Wood, May Duke.

QUINCES. Champion, Orange.

GRAPES. Concord, Moore's Early, Champion, Ives' Seedling, Catawba, Niagara, Agawam, Ulster Prolific.

*Promising.*—Pocklington, Jefferson, Vergennes.

CURRANTS. Fay's Prolific, Cherry.

GOOSEBERRIES. Downing.

BLACKBERRIES. Wilson's Early.

DEWBERRIES. Lucretia.

RASPBERRIES, BLACK. Souhegan, Gregg.

RASPBERRIES, RED. Cuthbert, Shaffer's Colossal.

STRAWBERRIES. Sharpless, James Vick, Wilson's Albany, May King.

*Promising.*—Jessie.

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## WELLS COUNTY—TWO REPORTS.

APPLES. *Summer.*—Red Astrachan, Early Harvest, Sweet Bough.
*Fall.*—Rambo, Maiden Blush, Fall Wine.
*Winter.*—Grimes' Golden, Northern Spy, Grindstone or American Pippin.
*Crabs.*—Transcendent, Hyslop.
PLUMS. Purple Gage, Wild Goose.
PEARS. Bartlett, Kieffer, Flemish Beauty.
CHERRIES. Early May, Olivet.
GRAPES. Concord, Niagara, Delaware, Moore's Early, Pocklington.
CURRANTS. Cherry, Fay's Prolific, White Grape, Red Dutch.
GOOSEBERRIES. Houghton, Downing.
BLACKBERRIES. Snyder, Wilson's Early, Kittatinny.
DEWBERRIES. Lucretia.
RASPBERRIES, BLACK. Gregg, Souhegan, Ohio, Miller's Daily.
RASPBERRIES, RED. Crimson Beauty, Turner, Eaton's Seedling.
STRAWBERRIES. Crescent, Jessie, Sharpless, Bubach, Piper's Seedling.

## WHITLEY COUNTY—TWO REPORTS.

APPLES. *Summer.*—Early Harvest, Red Astrachan, Sweet Bough, Golden Sweet.
*Fall.*—Maiden Blush, Fall Pippin.
*Promising.*—Alexander, Duchess of Oldenburg, Wealthy.
*Winter.*—Ben Davis, Baldwin, White Pippin, Grimes' Golden, Rhode Island Greening, Northern Spy.
*Promising.*—Mann.
PEARS. Bartlett, Flemish Beauty.
CHERRIES. Early Richmond.
QUINCES. Orange.
GRAPES. Concord.
CURRANTS. Victoria.
*Promising.*—Fay's Prolific.
BLACKBERRIES. Snyder.
RASPBERRIES, BLACK. Gregg.
RASPBERRIES, RED. Cuthbert, Turner.
STRAWBERRIES. Crescent, Parry, Sharpless, Bubach, Jewell.

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